The Chemical Age

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Changing Industry

IT is not without value to a great industrial country to possess a Prime Minister who is himself an industrialist. Mr. Baldwin, making perhaps his last appearance last week in the dual role before the Federation of British Industries, took advantage of the opportunity to point to the manifold changes that have occurred throughout industry within his experience, during the last fifty years. The slow centuries of change that preceded the industrial revolution gave point to the dictum of a prominent Elizabethan that in nature changes were customarily so slow as to be imperceptible, and that it were well that in human institutions we should simulate nature. If the industrial history of the past fifty years teaches anything it is that it is now no longer possible to plan ahead on the hypothesis of slow, almost imperceptible, change that can be long foreseen, but that to-day changes come with remarkable speed, and in quite unexpected directions. Many chemical products have quite suddenly disappeared from the market because their place has been changed by a cheaper or better synthetic product. Manufacturing processes, too, have their day and are quite suddenly displaced by others. These things are now the commonplace of industry, and the fact of their existence is the primary justification (in the board room at all events) for much of the industrial research that is conducted. A firm, an industry, or a country that would prosper must be one move ahead scientifically and technically of its competitors.

Mr. Baldwin did not refer in his address to changing products and processes, but he mentioned a number of other changes that affect both employers and workers. There is for example, the easier conditions of work consequent upon the growth of machinery, and upon improved lighting, ventilation and general working conditions. The most important and pregnant of the changes is that of speed—the ever-increasing rate of production consequent upon increasing mechanisation that tends to make the worker a cog in a machine and to set up nervous strains such as our grandfathers never knew; an effect that was amusingly parodied, and pilloried, by Mr. Chaplin in that noteworthy contribution to industrial discussion, "Modern Times." Fortunately, this mechanisation has been accompanied by decreased working hours; if it were not so we had all become neurotics. The 72, and occasionally 84, hours of fifty years ago, has been replaced by serious discussion on the desirability of the 40-hour week, with suggestions, equally serious, that we shall ultimately arrive at a condition when the right use of leisure will be far more important than work.

Concurrent with these changes has been the social revolution whereby employers and employed settle their differences by negotiation, to the great improvement of social relations between them; and in addition the rhyme of Peirs Plowman has nearly come true: "When Adam delved and Eve span, who was then the gentleman?" All recognise that they are working together for the prosperity of all; to some it is given to direct businesses, to some to advise technically, to some to manage works, to some to do the financial work; some push the pen, others the wheelbarrow, but each in his sphere knows that he is contributing his quota to the general prosperity. Economic nationalism may be bad, but it has had the merit of assisting all ranks of the community to recognise their interdependence, and to realise the value of any job well done, whether by brain or hand.

Perhaps the greatest change of all has been the falling away of our once great export trade. Mr. Baldwin pointed out with vigour the need for rehabilitation in that field. Mechanisation has permitted the backward countries to catch up on the production side, and production has become world-wide, instead of being the perquisite of the few. Mr. Baldwin's words are worth quoting. He believed this spreading of industry to be all to the good "because whether it be in the Dominions, or whether it be in foreign countries, the fact that people are carrying on prosperous undertakings will be to our advantage, provided we make the best use of our skill, our brains, our designs, our colour, our art, our research. It is on that alone that industry in this country can develop to the best advantage."

Put into plain language, this means that factors outside our control, such as standards and cost of living, transport costs, and economic policy of other nations will prevent us from competing in standard products throughout the world. Our export trade in common, mass-produced, articles will never return. Our greatest asset lies in our brains, and through our brains in our individuality. We must keep one step ahead of most of the rest of the world if we are to retain our place. We can only do that by means of research and development work. We must discover new processes, new products, new inventions, always something new that the world will want to buy. "Research, and ever more research," must be our watchword. Chemical plant manufacturers know that it is one proposition to make straightforward sheet-steel work, and quite another, with different price values, to make specialised plant. Britain must concentrate on the specialised goods; and it is her scientific and technical men who will make it possible for her to do so.

Notes and Comments

Export Trade

REVIEWING the industrial situation in his presidential address to the Federation of British Industries last week, Lord Hirst expressed his perturbation at the growing adverse balance of overseas trade and suggested that it was the duty of the Government to impress upon overseas countries that if they wished us to be in a position to continue purchasing on the scale we are now doing it was essential that these overseas markets should be ready to absorb the products of British industry. So far as the chemical industry is concerned, the adverse balance has been reduced during the first quarter of 1937, but in the light of the general trend over the past two or three years it is doubtful whether the relationship will be continued throughout the year. Our overseas friends may say that British industry is so busy that it does not want orders, or is not capable of filling them, but Lord Hirst pointed out that that is quite untrue. There is a large range of industries that are not affected by the present abnormal demand in this country and which are both able and willing vastly to increase their exports if foreign countries are prepared to accept them. Lord Hirst reminded the Federation that if there should be any general diminution in business activity, the export trade of this country would be one of the first to suffer. It is to be hoped that by that time the work of our research laboratories and of all the creative brains which British industry possesses will have devised new products, new processes and new technique which will ensure in the future, as has been the case ever since we became an industrial nation, that British industry is just a little bit ahead of any other in inventiveness and progress.

Carbide Industry for North Wales

WHEN Parliament rejected the Caledonian Power Bill—which was concerned primarily with the establishment of a calcium carbide industry in the Highlands—there was general agreement as to the desirablity of setting up such an industry in Great Britain, and attention was turned to a study of the relative advantages of Scotland and South Wales as the most appropriate site. The "Manchester Guardian Commercial" throws new light on the subject by announcing that a scheme has actually been submitted to the Government for establishing a carbide industry at Llannerch-y-Mor, on the Dee estuary, North Wales, a site with excellent transport facilities for the supplies of anthracite from South Wales and within easy reach of the consuming trades. Within a radius of 100 miles from the site there is a normal demand for 20,000 tons of carbide per annum, and the plans for the works aim, in the first place, at producing this quantity each year; further extensions could be made without any difficulty. Ample supplies of limestone are at hand in the Grange quarries in the Halkyn Mountains. Some 40,000 tons of limestone will be required each year for the carbide works, but in addition the quarry output will be 210,000 tons a year of hydraulic lime, hydrated lime, chippings and road stones and other products. These other materials may be regarded somewhat as by-products and would serve as a useful "buffer" to ensure that the price of limestone needed for making carbide is always at a minimum.

Economics of the Scheme

THE promoters of the North Wales carbide industry scheme propose to open a colliery at the site and to produce the coal necessary for generating the power requirements. It is estimated that sales of by-products will enable the promoters to obtain all the boiler fuel and all the gas they require for heating the lime kilns, for nothing. To produce 20,000 tons of carbide a year the electrical demand will be for less than 80,000,000 units, since the figure of 4,000 kWh per ton is the very maximum. The plant would be run continuously, so that the generating station would have to produce about 250,000 units a day and the load factor of the station should be in excess of 90 per cent. An independent and authoritative calculation has been published previously for the costs of generating 200,000 units a day at a load factor of 90 per cent., and, taking the cost of boiler fuel at 12s. 6d. a ton, the cost of electricity has been derived at 0.16d. per unit. Of this amount no less than 0.07d. a unit is accounted for by the cost of coal, so that if, as in the proposed North Wales scheme, the boiler fuel costs nothing, then the cost of generating electricity is brought down to 0.09d. per unit. This scheme has been worked out in detail with estimates by independent authorities on all figures for costs, production, and similar essential points. It appears certain that the scheme will enable electricity to be generated at a price which will ensure the success of the factory.

The British Association

AMONG the subjects to be discussed at the annual meeting of the British Association for the Advancement of Science at Nottingham from September 1 to 8 are X-ray methods in industry, problems of labour transference, the contribution of physiology to the health of the individual and the community, adult education, the problem of costs of distribution, the human factor in industry, industrial physics, chemistry and building research, motor vehicles and road safety, planning the land of Britain and the vulnerability of the national power supply. Dr. F. L. Pyman, director of research, Boots Pure Drug Co., Ltd., is the president of the Chemistry Section this year and will devote his sectional presidential address to a review of recent research in chemotherapy. Another sectional presidential address likely to be of interest to the chemical engineer will be that of Sir Alexander Gibb for the Engineering Section; his subject will be research in engineering. Professor Sir Edward Poulton, president of the Association, will deal with evolutionary thought as recorded at the meetings of the British Association.

Imperial Chemical Industries' First Decade

Profits From and For Research

LORD McGOWAN presided at the tenth annual meeting of Imperial Chemical Industries, Ltd., at Queen's Hall, Langham Place, on Thursday morning, and after reviewing the events of the past decade, referred with cautious optimism to the prospects of the future.

Since welding into a harmonious whole the various companies which came into the merger in 1926, they had, he said, passed through the depths of the greatest industrial and agricultural depression known in modern economic history, but had now, in common with the general industries of the country, returned to the level of reasonable prosperity at which they began. They had consistently maintained a policy of intensive research, directed to the improvement of existing processes, the discovery of fresh uses for existing products and the development of new processes and products. Their total expenditure for this purpose has been no less than £6 million. It was unwise in any industry to wait for a plant to wear our before introducing a new process or idea. They therefore continued to keep their methods of production up to the highest state of efficiency and to investigate new and improved processes.

Rationalisation Policy

They had continuously studied and pursued the policy of rationalisation and concentration which they originally set before them. During the ten years they had closed 38 factories and spent some £7 million on concentration schemes. They were deeply sensible of their responsibility to the tens of thousands of human beings closely linked to their continued stability and prosperity, including not only the very large number of employees, but the larger number of stockholders, most of them holding but a few hundred pounds of stock, and their still more numerous customers. Practically no man, woman or child in this country, and few industries, got through a single day without using, in some form, one or other of the products of I.C.I.

Referring to the petrol plant at Billingham, Lord McGowan said that up to date it had not shown results which would justify its description as a good commercial proposition even with the advantage of the existing customs duty and without that protection, of course, the enterprise would be uneconomic. These results were explained by the fact that they were in the early stage of a new industry, the first of its kind, not only in this country but in the world, in which they had met with more difficulties than they anticipated. That was one of the risks they knew they ran. Nevertheless, they had overcome first one trouble and then another, so that throughout last year there was a steady improvement in the working of the plant, while the personnel had become thoroughly familiar with the intricacies of the process. They were still convinced that they took a right decision when they embarked on this enterprise, and, notwithstanding the great publicity recently given to alternative methods, they were satisfied that the hydrogenation system was the best technical and commercial process for the conversion, without creating by-products, of coal into motor spirit. Moreover, it was developing an entirely new field of the chemical industry from which they were already deriving ancillary benefits of considerable value.

A Diminishing Volume of Business

Speaking of profits, Lord McGowan said the present time of prosperity could not be permanent and they would in time face a diminishing volume of business. Therefore, it was essential that industrial corporations should take advantage of existing good conditions to put their house in order; that they should, out of to-day's surplus earnings, equip themselves with the most up-to-date plant procurable, so that they should have the lowest operating cost possible. They would then continue to be competitive with the rest of the world. A corollary to what he had said was the necessity, in his opinion, of spending more and more on research. It was only by doing so that they could improve the working and consequent efficiency of known processes, the quality of their raw materials — even the substitution of more effective raw materials—and meet the necessity of finding new lines of manufacture. In protected countries governments could claim that they were doing what they could for industry, and it was surely not too much for those governments to expect industrial leaders to return to see that industry was kept efficient, which could only be done by spending money on research. Industrialists were trustees, not only for their shareholders, but for their workers; the prosperity of an industry, and its stability over a long period of years, rested ultimately upon keeping level with the general front of research.

Prospects for 1937

With the world wide tendency to rising commodity prices, with a policy of rearmament, and with no likelihood of any serious setback in general building activity, there seemed to be no reason to anticipate any decline in 1937 in the general level of the country's activity. It did not, of course, follow that profits would show the same tendency. They had to face notable rises in the prices of raw materials, and increases in wages would add substantially to their costs. While they had little doubt of the volume of home trade, they found it difficult to contemplate the situation in export markets with equal confidence. However, much as they might disapprove of economic nationalism, it was a tide they could not stem. The world would always conduct a considerable volume of international trade. But, coupled with that necessity, they must recognise and meet for many years the natural desires of great nations, and even small ones, to use their powers in such a manner that their national life presented fairly well-balanced industrial and agricultural activities.

Old Haphazard Methods

It was not unnatural that agricultural nations should seek to establish within their boundaries such manufacturing industries as appeared suitable. National pride was not slow to foster this ambition. With a greater home production of foodstuffs and almost a stationary population, some of their Dominions—Australia and New Zealand, for instance—may have reached their maximum export of primary products to this country. They, themselves, may therefore have to produce goods they now bought from Great Britain. If in the consequential industrial development, old haphazard methods went by the board and a due regard was paid to science and economics, these countries would enjoy a greater prosperity over a wider front, thus giving them a higher purchasing power, from which in due course Great Britain should benefit. As they believe with Ministers and eminent bankers that it would be a mistake to abandon their strenuous efforts to maintain export trade, and take the easier course of concentrating entirely upon requirements of domestic industry, they would continue every effort to hold and extend export business.

These facts, apart from liability to the new National Defence Contribution, led him to a cautious view of the outcome of the year 1937, but stockholders might rest assured that as in the past the efforts of the whole organisation would lie behind the desire to meet them next year with a balance sheet and report which they would regard as satisfactory in the conditions which had appertained.

Unshrinkable Wool

A New Non-Chlorine Process

ALTHOUGH it is quite easy to make wool unshrinkable it has so far proved impossible to do this without adversely affecting its properties either of durability, handle, or colour. These difficulties have been associated with unshrinkable finishes since they were first practised some forty years ago, and in spite of many attempted improvements in the process they have remained substantially unsolved. It is therefore not surprising that Mr. A. J. Hall's recent lecture on "A New Non-chlorine Process for Making Wool Unshrinkable" was received with considerable interest before a large attendance of the Manchester Section of the Society of Dyers and Colourists, and that representatives of the wool industry from Scotland, Yorkshire, and the Midlands were present to note the essential features of a process which so far promises to be of great importance.

Difficulties in Existing Practice

The almost universally employed unshrinkable process is that of treating the wool material with an acidified solution of sodium hypochlorite or a solution of chlorine gas. More recently, the Wool Industries Research Association, at Leeds, have been developing a process which uses chlorine gas. Two factors are of considerable importance in such processes. Firstly, the absorption of chlorine by the wool must be uniform and secondly the resulting unshrinkability must be secured without damaging the wool. In the wet treatment of wool with hypochlorite the absorption of chlorine is so rapid that uniform treatment is most difficult to obtain. In the treatment with chlorine gas it is believed that the same difficulty is experienced with the added complication that the effect of the gas is much influenced by the amount of moisture originally present in the wool; wool being markedly hygroscopic it is essential that it shall be dried to a definite moisture content before treatment.

Whatever difficulties may attend the treatment of the wool with chlorine or hypochlorite, there is one fundamental objection to all treatments of wool with the active halogen. The objection is that the treatment has an oxidising action and can thus affect the wool substance so that the fibres are damaged.

This damage is revealed in many ways. For example, the treated wool has a higher solubility in dilute alkalis, it has a markedly higher affinity for acid dyes, the epithelial scales which cover each fibre are partially removed so that they expose the less resistant cortex to the damaging influence of chemicals and weathering, and the sulphur content of the wool is reduced (this is obviously due to oxidation). This damage is revealed to the public in the decreased wearing properties of the wool garments they purchase. As a matter of fact, in the past it has been so well recognised that the usual chlorine unshrinkable processes damage wool that it is usual to reduce the strength of the treatment so as to avoid appreciable damage, but this is at the price of leaving the wool material less shrinkable than in its original state, but yet definitely shrinkable.

Large Scale Plant in Nottingham

Mr. Hall's new process has been developed at the works of Adams and Co., Nottingham, where a large scale plant is now working. The process is world patented and licenses are being granted to wool firms to work it. The process has already aroused a good deal of interest among wool manufacturers and finishers and a considerable number of firms are investigating its possibilities. Wolsey, Ltd., of Leicester, H. Harrison (Finishers), Ltd., of Leicester, H. Fletcher and Co., Ltd., of Halifax, J. and J. McCallums, Ltd., of Paisley, The Springfield Hosiery Finishing Co., Ltd., of Nottingham, and Turnbulls, Ltd., of Hawick, have acquired licenses. The installation of the necessary plant will probably occupy about three months, but meanwhile others who are interested can have samples treated.

The process itself is based on the discovery that wool becomes unshrinkable when it is steeped for a short time in a solution of sulphuryl chloride in an organic solvent (this latter, of course, must be inert to the sulphuryl chloride). Among the suitable solvents are carbon tetrachloride, trichloroethylene, toluene, and petroleum fractions. On the large scale, white spirit of fairly high boiling point is used since it is cheap and is widely used in the dry cleaning industry.

General Treatment

The general treatment consists of immersing at room temperature for about one hour the air-dry wool in a 1½ to 2 per cent. solution of sulphuryl chloride in white spirit. The material is then freed from excess of liquor and thoroughly washed with water, then neutralised with a solution of ammonia or soda ash, and finally washed and dried. During treatment only about 50 per cent. of the sulphuryl chloride is used up. The waste liquor is therefore collected and fresh sulphuryl chloride is added to bring it up to strength so that it can be used again. Losses of white spirit are in this manner reduced to a minimum and this loss is not serious.

It is important to note that the wool is used in its air dry condition since, as is well known, dry fabric is immediately saturated when placed in an organic solvent such as white spirit; this feature of the process suggests the ease with which perfectly uniform treatment of the wool material is obtained. On the other hand, there is no necessity for bringing the wool to a closely specified moisture content; it is satisfactory if the wool is simply air dry. Wool can be treated wet (as out of a hydro-extractor) and the reaction proceeds in the same manner as with dry wool except that it is more energetic. With wet wool, however, the rapid penetration is not secured.

During the treatment, the sulphuryl chloride which enters the wool fibres is hydrolysed by the moisture there present. There is thus formed a mixture of sulphuric and hydrochloric acids, and it is in this formation process that the wool loses its felting properties. No free chlorine can be detected at any stage during the treatment. The acids are retained by the wool and it is for this reason that the wool must finally be thoroughly washed after the treatment.

Wool Not Chemically Changed

Careful examination of wool fibres treated by the process has shown that they do not lose their epithelial scales, and, moreover, they are not affected as regards diameter and length. Wool yarn, after treatment, has been found to be slightly more extensible and its strength is somewhat higher than the original strength. In general, it is believed that the wool is not chemically changed, and is left as 100 per cent. pure wool. Analysis of treated wool shows that its sulphur content was not changed. The new process has no appreciable affect on most wool colours so that it can be applied satisfactorily to dyed wool goods. This is important for yarn dyers, since it will now be possible to treat the dyed yarn. Wool garments or hose can be treated by the process after manufacture if so desired. The presence of impurities in the wool, such as natural grease or manufacturing oils, is no hindrance to the process; scouring of the wool material can thus be carried out before or after the unshrinkable treatment. The treatment actually assists purification of the wool since it is similar to a dry cleaning operation.

FORMIC ACID IS TO BE PRODUCED near Budapest by the Ameisensaeure Co., recently founded for that purpose.

Brenthol Mixtures, Thickenings and Fluorescence

Three Papers at Manchester Meeting of the Society of Dyers and Colourists

ALTHOUGH the general usage of azoic colours made use of straight combination, that is, one Brenthol or Naphthol coupled with one developer, it was frequently necessary in dyeing to make use of mixtures, said Mr. H. Blackshaw in a paper on "Brenthol Mixtures—Calculation of Quantities" read before the Manchester Section of the Society of Dyers and Colourists, on April 16, when Mr. N. Chappell, M.Sc., presided. This might be due to the absence of a straight combination which would meet the requirements of shade or fastness, or it might be due to a dyer wishing to employ such products as he might have in stock, thus avoiding the necessity of ordering special supplies for the work in question, continued Mr. Blackshaw.

When one realised that with the present range of products available for the production of azoic colours on the fibre that approximately 1950 straight combinations were available it might appear surprising that there was any technical necessity for a wide use of mixtures. A detailed study of the various combinations, taking into consideration the method of dyeing available would, however, soon show that there were a number of gaps necessitating mixtures which would combine the characteristics of two straight combinations, particularly with regard to shade.

Three Possibilities

The azoic dyer could do one of three things when considering the use of mixtures. Two or more Brenthols or Naphthols might be mixed and combined with one developer. Two or more developers might be mixed and combined with one Brenthol. Two or more Brenthols might be mixed and combined with two or more developers.

Developer mixtures should be avoided wherever possible, and should only be used when careful pre-testing had determined that the proposed mixture of developers would give the anticipated shade, and that the resultant dyeing possessed the expected fastness properties, particularly to light and to boiling soap or soda ash treatments. The fastness properties of developer mixtures were not necessarily in accordance with the fastness of the individual components, this being probably a question of the physical condition of the colouring matter in the fibre. One of the most difficult points in developer mixture was that of coupling speed. There was a much greater difference in the speed of coupling of various developers provided that the Brenthols in question were all chemically related, *i.e.*, derivatives of 2:3 hydroxynaphthoic acid. The difficulties naturally increased if of two developer components the more rapid coupling component was present in major proportion with a minor proportion of the slow coupling component. Such a mixture would probably be impossible to control in bulk dyeing, particularly in yarn dyeing. Piece goods developed on the pad would possibly give the best results for such a mixture.

Modern Thickenings

In his paper on "Modern Thickenings," Mr. J. A. Kiernan said that British gum, in one form or another, had been the mainstay of printing. The starch, whether it be of wheat, maize, or other cereal or root, was given a pre-treatment with acid and roasted at varying temperatures and periods in order to produce the necessary effect. This treatment of the starch cell had been known for more than a century, the classice story being that of a fire which broke out in a Dublin textile mill. A quantity of farina was stored in a building adjacent to the fire. It was noticed that the starch which had been exposed to the heat had been roasted to a brownish-yellow colour. It had been entirely changed in nature, and when dissolved in cold water produced a highly adhesive liquid.

During the past 20 years there had been changes in many types of dyestuffs used, which were either alkaline or were printed in alakline state. Bearing this in mind, the firm of W. A. Scholten, Groningen, Holand, brought into being two thickenings quite different from the usual types. They commenced the modification of starch by chemical process a quarter of a century ago, but it was only within the last seven years that the two thickenings had been developed. They were known as Solvitex B.G. and S.T., and were cold, soluble starches. Before being put into the hands of the British printer they were tried out extensively on the Continent.

By experiment it was found that the standard method of printing vat colours in fine lines by the old British gum or British gum starch process did not prove as successful as by using the new combination of cold soluble Solvitex B.G. and weak starch. Furthermore, a higher colour yield was obtained.

Printing with Confidence

Both the Solvitex thickenings could be printed with complete confidence in conjunction with starch in alkaline medium. Unlike ordinary starch pastes they could be maintained for considerable periods without deterioration, while the S.T. gave double the yield of its counterpart, B.G. The latter, as a medium alone, had no equal for indigo discharges. It cut an excellent mark and carried the leucotrope or rongalite into the fabric with such effect that a very pure white or yellow resulted. Compared with British gum it gave approximately 10 per cent. to 15 per cent. better results. In conjunction with starch the B.G. formed an excellent thickening for printing Aniline Black, the Indigosols and Steam Colours especially, where a universal thickening was required in a colour shop.

Dealing with Rapidogen colours, Mr. Kiernan stated that the firm of W. A. Scholten had introduced the alternative Solvitex thickening which they had named S.T. It was readily soluble in cold water, and was miscible with starch in all proportions when boiled together. If there was such a thing as a perfect thickening for printing Rapidogens this combination provided it.

A third paper, on "Testing by Fluorescence" was read by Mr. J. A. RADLEY, M.Sc., A.I.C., who stated many substances showed fluorescence when irradiated with ultra-violet light.

To cut out the visible light given out by the source of the rays, and which would mask the intensity and the colour of the fluorescence, the rays were passed through a nickel oxide glass filter which transmitted ultra-violet light only. The intense fluorescence showed by many substances in these days often constituted a very delicate, but presumptive, test for their presence. The interpretation of the results was often difficult, the delicacy of the test, in many cases, actually constituting a drawback to its use.

The uses to which the fluorescence method might be put in textile and associated trades could be classed broadly as (1) examination of raw materials, (2) detection of faults, (3) identification of substances present in dressings. The lamp should preferably be operated in a darkened room, and the eyes allowed to become accustomed to the darkness before making any observations.

Annual Meeting of Manchester Section

The annual meeting of the Manchester Section of the Society of Dyers and Colourists was held in the Lecture Room of the Literary and Philosophical Society on April 16, Mr. N. Chappell, M.Sc., presiding.

The annual report, presented by the Hon. Secretary, Mr. J. G. Evans, stated that the membership of the Section was

249 full members, 24 associates, and 16 juniors, making a total of 289. The corresponding figures for the previous year were 234 members, 32 associates, and 18 juniors, totalling 284.

During the session seven general meetings had been held, two of them jointly with other societies. The average attendance at the meetings was 80 persons.

By the death of Mr. W. F. A. Ermen, M.A., the committee and section had been deprived of a very loyal and active member, who had served as chairman and also on the committee for many years.

In August, 1936, Mr. L. G. Lawrie completed a term of just over two years as chairman of the section. Mr. N. Chappell, after 11 years' service as hon. sec. to the section, was elected to succeed Mr. Lawrie.

The Knecht Memorial Prize was awarded to Mr. Sidney Russell Cockett, of Hoo Hall, Mytholmroyd, a student of the Royal Technical College, Salford, and to Mr. Allan Rostern, of Chadderton, near Oldham, a student of the College of Technology, Manchester.

Miss Eva Hibbert, M.Sc. Tech, Mr. J. R. Hannay, F.I.C., and Mr. L. G. Lawrie, A.I.C., were unanimously re-elected members of the committee.

Imperial College of Science and Technology

Progress in Chemical Technology and Chemistry for 1935-36

ACCORDING to the 29th annual report of the Governing Body of the Imperial College of Science and Technology, South Kensington, for the year ending July 31, 1936, a year ago, in view of the approaching retirement of Professor Bone from the Chair of Chemical Technology, a committee was appointed, under the chairmanship of Lord Rayleigh, to consider the future organisation of the Department of Chemical Technology. After full investigation this committee made a detailed report, their main proposal being "that the University be asked to agree to the institution of a course leading to the degree of B.Sc. (Engineering) in Chemical Engineering, on the basis of 4 years post-matriculation or 3 years post-intermediate Science." This report was unanimously adopted, and the proposal was immediately forwarded to the University, who have agreed that a B.Sc. degree in Chemical Engineering for internal students in the Faculty of Engineering be instituted, and that a board of studies in chemical engineering be instituted in the Faculty of Engineering.

Professor W. A. Bone, D.Sc., Ph.D., F.R.S., retired on age limit at the end of the session from the Chair of Chemical Technology, which he had held from its inception in 1912. As first head of the department, he succeeded in developing it into a flourishing school of research with an international reputation. With the financial assistance of outside bodies, the college has been able to make arrangements for accommodation to be available for him after his retirement, in order to enable him to continue to supervise the researches with which he is most closely associated. In addition, the title of Emeritus Professor has been conferred upon him. As his successor, the University have appointed Mr. A. C. G. Egerton, M.A., B.Sc., F.R.S., reader in thermodynamics in the University of Oxford.

During the session full-time post-graduate courses were given in the department in fuel technology, including refractory materials and high pressure gas reactions, chemical engineering and electro-chemistry, and after the sessional examinations in these subjects 17 persons were recommended for the award of the D.I.C. for advanced study.

Systematic Researches

The following systematic researches have been actively continued in the Department of Chemical Technology:—(i) Explosions and catalytic reactions at high initial pressures as well as on gaseous combustion generally, with the aid of grants from Imperial Chemical Industries, Ltd., the Gas Light and Coke Co., the South Metropolitan Gas Co., and Radiation, Ltd.; (ii) photographic analyses of the initial stages and detonation in gaseous explosions at ordinary pressures, with the aid of grants from the Royal Society and Imperial Chemical Industries; (iii) blast furnace reactions, under the auspices and at the expense of the British Iron and Steel Federation; and (iv) chemical constitution and maturing of coals, with the aid of grants from the Fuel Research Board of the Department of Scientific and Industrial Research, in the Fuel Section under the direction of Professor W. A. Bone; (v) flow of liquids through granular beds; (vi) flow of liquids through filter cloths; (vii) flow of liquids over circular weirs; (viii) flow of heat through beds of granular materials; (ix) evaporation of liquids in air currents; (x) power distribution in ball mills; and (xi) cyclone separation, in the Chemical Engineering Section under the direction of Assistant-Professor S. G. M. Ure; (xii) the electrical condition of hot surfaces during the adsorption of gases; (xiii) gaseous combustion in electric discharges; (xiv) catalytic and electric properties of thin metal films; (xv) examination of metallic and other surfaces by the method of electron diffraction, with the aid of grants from the Royal Society, the Department of Scientific and Industrial Research, Imperial Chemical Industries, Ferranti Ltd., E. G. Acheson Co., and the Westinghouse Brake Co., in the Electro-chemistry Section under the direction of Assistant-Professor G. I. Finch.

Blast Furnace Reactions

The blast furnace reactions research, which has been carried out in the department for some years past under the auspices of the British Iron and Steel Federation, has been materially extended, especially in the field tests conducted in conjunction with the management of the Appleby Frodingham Steel Co. A large number of samples of the products from the interior of a blast furnace have been obtained during its normal operation. Some of these have been examined on the spot, the remainder being sent to the College for analytical tests. John Lysaght, Ltd., of Scunthorpe, have also co-operated in allowing facilities for the examination of a dead furnace, when, after going to considerable trouble and expense, they arranged for the removal of the burden under the supervision of Dr. H. L. Saunders, for the purposes of its visual and analytical examination.

In addition to the foregoing, the special research for Imperial Chemical Industries, Ltd., on the influence of high pressures upon chemical changes in the liquid phase which is being carried out by Professor Bone and Dr. Newitt, in conjunction with Professor Thorpe and Dr. Linstead in the chemistry department, has progressed successfully throughout the session.

Nine persons gained the Ph.D. Degree of London University, another the Ph.D. Degree of Zurich, and yet another the Ph.D. Degree of Cambridge University, upon their research work in the department.

Regarding the outside services of the staff of the Department of Chemical Technology it is recorded that Professor Bone has been appointed a member of the Institution of Gas Engineers Advisory Research Committee, and has continued to act as the Chairman of the Blast Furnace Research Sub-Committee of the British Iron and Steel Federation. Assistant-Professor S. G. M. Ure has continued to act as a member of council, education committee, and board of examiners of the Institution of Chemical Enginers, also a member of its pub-

lication committee and hon. editor of its transactions, and continued to act as a member of the technical committee of the chemical engineering section of the World Power Congress.

As in recent years, the available space in the Department of Chemistry, both for under-graduate and postgraduate workers, has been fully utilised. Certain adjustments in the second year chemistry course, to which allusion was made in last year's report, have now been completed, and it is anticipated that these changes will secure a more efficient preparation for the work of the final honours year. The postgraduate courses in the analysis of food and drugs and in agricultural chemistry continue to attract every year not only some of our own students, but also a regular flow of senior workers from laboratories and institutions in the Dominions and Colonies. The provision of special training in micro-chemical methods under the charge of Mr. L. S. Theobald and Dr. T. G. Pearson, has proved an extremely valuable adjunct to the work in food and drugs analysis and in agricultural chemistry.

Progress of Researches

Research in the department proceeds steadily and deals with a notable variety of subjects. The research on air-borne dusts carried out with the assistance of grants from the Institute of Chemistry and the Medical Research Council, and with the encouragement of the Institution of Mining and Metallurgy, is being actively prosecuted. During the year under review, with the substantial backing of the Agricultural Research Council, an investigation of soil parasiticides under the supervision of Mr. A. G. Pollard has been started, and is progressing satisfactorily. The International Tin Research and Development Council has generously assisted in investigations on the electro-deposition of tin alloys.

The department is, as in previous years, indebted to Imperial Chemical Industries, Ltd., for a generous contribution towards the expense of chemical research; various members of the staff are indebted also to the Royal Society for grants.

There have been no changes in the personnel of the teaching staff of the Department of Chemistry during the session 1935-36, but Dr. J. S. Anderson has been promoted to the rank of assistant lecturer. Professor F. A. Paneth, the guest of the department, has given valuable help in the supervision of research workers and in the delivery of lectures on radioactivity to third-year students. Mention should be made also of a special postgraduate course of lectures on colloids given in the department by Mr. A. King.

Several of the senior research workers have left at the end of the year, among whom may be mentioned Dr. J. S. Tapp; he was the holder of an 1851 Studentship and has now returned to Canada. During his time here he carried out notable experimental studies of critical point phenomena. Dr. Kenneth Stewart has been awarded a University of London Travelling Studentship and has proceeded to Hamburg University, where he is working in the laboratory of Professor Harteck.

An arrangement has been made with the Rubber Growers' Association by which a further organic chemistry assistant has been provided for a period of three years for the purpose of carrying out research on unsaturated hydrocarbons. The two research assistants formerly supplied by the Research Council of the Imperial Chemical Industries have been replaced by one assistant who will work under the Dyestuffs Group of the British Dyestuffs Corporation.

Society of Glass Technology

20th Annual Meeting

THE 20th annual meeting of the Society of Glass Technology was held in Sheffield on April 14. Professor W. E. S. Turner, D.Sc., F.Inst.P., was elected president in succession to Mr. Bernard P. Durring, A.R.C.S., F.Inst.P., and Mr. M. Parkin, M.Sc., A.I.C., was appointed hon. secretary in place of Professor Turner. Mr. F. G. Orme was re-elected hon. treasurer, and Mr. F. C. Flint, American treasurer.

To fill vacancies due to retirement the following were elected :—Vice-presidents, Miss V. Dimbleby, M.Sc., and F. E. Lamplough; ordinary members of council: Alec W. Clark, Graham Cunningham, H. W. Howes, G. I. C. Marchand, and C. E. Ramsden.

Messrs. Holmes, Widlake, and Gibson, chartered accountants, Sheffield, were appointed auditors.

At an ordinary meeting of the society which followed the annual meeting, it was announced that the Society would, in 1937, celebrate its coming of age, its first meeting having been held in Sheffield on November 9, 1916. It was thought appropriate, therefore, that the society should begin the celebration of its 21st birthday by meeting in Sheffield on November 9.

Viscosity Measurements

A paper entitled, "The Viscometer in Works Practice" was presented by Mr. H. L. Crook, who expressed the views that viscosity was the physical characteristic of glass having most importance in the manufacturing process, and that a viscometer even of a simple type gave results of such value that it was an essential part of the equipment of any progressive laboratory.

Mr. Cook described in detail how he had improved upon the apparatus originally used (a copy of that of R. F. Proctor and R. W. Douglas, see "J. Soc. Glass Tech.," 1929, *13*, 194). The experimental glasses were made in 2,000 gm. pots, chipped out after cooling, and transferred to the viscometer pot, the composition being determined after the viscosity measurements had been made, except in the case of opal glasses where loss of fluorine occurred during the experiment.

The viscosity measurements made upon these experimental glasses yielded valuable information upon the working characteristics of new glasses without having to try them on a large scale on the machines. In this way, new glasses were developed, with desired characteristics, such as increased chemical durability, but still able to be worked on the same machines as the normal flint bottle glass. The chemical durability of the glasses was measured by a "powder" method. The experimental work led to the adoption of a more durable glass which was melted in a continuous tank furnace and worked on the same machine as the original bottle glass.

From a study of the many results obtained for the viscosities of glasses differing in chemical composition in known ways, factors were deduced for many of the constituent oxides such as alumina, baryta, lime, boric oxide, magnesia and soda, and for manganese oxide in coloured glasses. Special precautions had to be taken in dealing with opal glasses, due to loss of fluorine, and possible corrosion of the refractories employed. An interesting point was established, namely, that with these glasses below 800°, no change in viscosity took place at constant temperature, but if the glasses were left at a temperature between 800° and 900°, a rise in viscosity occurred due to the growth of crystals, probably on the surface of the stirrer, thereby increasing its effective diameter. From this a method was devised for studying the crystallisation tendencies of glasses.

The correct procedure, to obtain a glass of longer working range was to reduce the lime, alkali being added in moderation. To counteract the evil effect upon durability of an increase in alkali, borax was used. The use of magnesia and baryta to give desired characteristics was also discussed.

The Chemical Age Lawn Tennis Tournament

Entries Close Next Tuesday Morning

ONLY three days remain in which to enter for THE CHEMICAL AGE Lawn Tennis Tournament, full details of which were published in THE CHEMICAL AGE of April 17.

As in previous years, the tournament is open to all members, both principals and staff, of the chemical industry throughout Great Britain. It will consist of a men's singles and a men's doubles competition, and the matches will be played during May and the following summer months. The winners of both competitions will hold THE CHEMICAL AGE silver challenge cups, jointly with the firms they represent, for one year, while smaller trophies will be presented outright to each of the winners and the runners-up.

The new ruling introduced last year permitting partners to be drawn, if necessary, from different firms, proved both popular and successful, and it will again apply this year. It is hoped, however, that, wherever possible, the old friendly rivalry between firms will be upheld by internal alliances.

All entries for the tournament must reach the Editor, THE CHEMICAL AGE, Bouverie House, Fleet Street, London, E.C.4, not later than first post on May 4. Entry forms have been issued, but for the convenience of those players who have not time to obtain them it will be sufficient to submit entries by letter or postcard, giving the following details:

Singles or doubles.
Name or names of competitor(s).
Name or names of firm(s).
Firm's address.
Telephone number

The chief point to remember is that next Tuesday morning is the latest time for the receipt of entries. The rules governing the tournament are printed below. The draw will be made on Tuesday, and competitors will be notified at once as to the result of the draw and the final date for playing off the first round matches. The first player or players drawn usually suggest(s) immediately to his or their opponent(s) a convenient date and place for the match, and upon completion of the event the result, signed by all players (winners and losers) is posted by the winners in time to reach the offices of THE CHEMICAL AGE by the closing date which will be announced at the time of the draw.

Rules of the Tournament.

1. Every competitor must be a member of the chemical industry, either as a principal or a member of a staff. There is no entrance fee of any kind.
2. Players in the Doubles need not necessarily be members of the same or associated firms, provided all players are members of the chemical industry as defined in Rule 1.
3. The Challenge Cups, which shall not be awarded outright, irrespective of the number of times they are won by the same players, shall be competed for annually on courts of any surface in accordance with the Rules of Lawn Tennis and the Regulations of the Lawn Tennis Association. The winners of the Cups shall make arrangements for their safe custody and insurance.
4. The competition shall be conducted on the knock-out principle, and the best of three advantage sets shall be played in all matches, except in the finals when either the best of three or the best of five sets shall be played at the discretion of the Editor of THE CHEMICAL AGE and the members of the tournament committee present at the finals.
5. **Entries shall be made not later than May 4, 1937, to:**
Lawn Tennis Tournament,
"The Chemical Age,"
Bouverie House,
Fleet Street, London, E.C.4
6. The draw shall be made on the first convenient day following the close of entries. The dates on or within which the several rounds must be played will be published in THE CHEMICAL AGE.
7. The Editor of THE CHEMICAL AGE, acting with the tournament committee, shall have the right to scratch any players who fail to play off their matches by the stipulated dates, or who otherwise fail to conform with the rules and regulations governing this competition.
8. Except in the case of the finals, players drawn against each other must make their own arrangements for playing off their match on a court mutually agreed upon. In the event of disagreement, the first name drawn shall have the right to choose the ground.
9. The result of each match must be sent by the winners to the Editor of THE CHEMICAL AGE, signed by all players (winners and losers), immediately after the match, and must reach the office of THE CHEMICAL AGE not later than by the first post on the day following the final day for playing off the round.
10. If any player be not present at the agreed place or time of the match, opponents shall be entitled to a walk-over, after having allowed reasonable time (say, a maximum of one hour) for the other's appearance. If the players find it impossible to play off their match on the day originally chosen, they must play it on any other day, to which both sides agree, within the stipulated period.
11. Any dispute arising between players, or otherwise, shall be referred to the arbitration of the Editor of THE CHEMICAL AGE, acting with the tournament committee, whose decision shall be final.
12. While competitors will decide as to hard or grass courts for the preliminary rounds, it must be understood that the Finals must be played on courts selected by the Editor of THE CHEMICAL AGE acting with the tournament committee.

A New "Synthetic Rubber"

Good Resistance to Oils and Chemicals

ARTICLES made from Neoprene or Neoprene compositions for use in various industries have been shown this week at an exhibition organised by Imperial Chemical Industries, Ltd., at the Federation of British Industries, 21 Tothill Street, Westminster.

Neoprene is a new raw material. It has rubber-like properties, and can be used for purposes for which natural rubber is wholly or partially unsuitable, but it is not a substitute for natural rubber. Actually, it is polymerised chloroprene. The presence of chlorine was viewed with suspicion at first, but practice showed that it cheapened the product and played a great part in determining its final quality.

Products of the old synthetic processes, based on isoprene, had the great disadvantage that they were difficult to mill. This was because their molecules were in the form of branched chains. By introducing chlorine the molecules have been made to form long, straight chains—as in natural rubber. Neoprene is the first "synthetic rubber" with this molecular construction; therein lies the ease with which it can be milled, extruded, or calendered. It possesses all the elasticity and tensile strength of the best natural rubber, to which it is in comparably superior in its resistance to oils and certain solvents. It has a higher resistance to ozone and ultra-violet radiation, is less affected by chemicals and less permeable to gases, and does not soften, but tends rather to harden, under the influence of heat. Its water absorption is low.

Neoprene will find special application in the manufacture of gaskets, washers and packing in all industries, and its resistance to oil and water mixtures will attract the attention of engineers concerned with air compressors, hydraulic machinery, and pumps in general. Diaphragms of oil-proof Neoprene may also be used for controllers, regulators and meters.

United States Zinc Industry

THE production of distilled and electrolytic zinc at reduction plants in the United States in 1936 amounted to 534,341 short tons, valued at $53,434,000, increases of 19 per cent. in quantity and 35 per cent. in value from the production of 449,284 tons, valued at $39,537,000, in 1935. Of the total for 1936, 491,803 tons were primary metal from domestic ore, 329 tons were primary metal from foreign ore, and 42,209 tons were secondary metal. In 1936 the total production of primary zinc included 364,957 tons of metal recovered by distillation and 127,175 tons recovered by electrolysis. Pennsylvania contributed the largest output of primary zinc, with 150,425 tons all produced by distillation.

Increased Activities at Mellon Institute

Dedication of the New Building at Pittsburgh

THE new building of Mellon Institute at Pittsburgh, which has been under construction for the past six years, will be dedicated on May 6, in honour of Andrew W. Mellon and Richard B. Mellon, the founders of the Institute. Dr. Edward R. Weidlein, director of the Institute, will preside at the dedication, and brief discourses will be given by Andrew W. Mellon and Richard K. Mellon, representing the founders. Addresses will also be given by three Nobel laureates, Dr. Irving Langmuir (chemistry), Dr. H. C. Urey (chemical physics), and Dr. W. P. Murphy (medicine). The new building will enable the Institute to carry on all its present research work with greater effectiveness and scope, and in addition to expand its scientific investigations into fields that up to the present have been closed by spatial limitations.

Evolved from a Small Organisation

The new building, like the one opened in 1915, is the gift of the late Richard B. Mellon and his brother, Andrew W. Mellon, former Secretary of the United States Treasury. The Institute was founded by the Mellon brothers because of their conviction that the future and the happiness of mankind depend on the progress of science. They knew that to ensure progress able scientists must be provided with adequate facilities for research, and believed that an independent non-profit scientific institution whose sole aim would be the search for truth would be a useful gift to humanity. They thought that science requires exclusive sacrifice, and therefore established the Institute to sustain research by men who have consecrated themselves to science. The carefully chosen staff is actuated by the object of making new discoveries, realising that the discoveries to be made will be probably more important than the discoveries already made.

Mellon Institute, as it exists to-day, has evolved from a small organisation that was brought together to inaugurate in Pittsburgh the system of investigational procedure conceived by Robert Kennedy Duncan. During a visit to Europe in 1906 Duncan was impressed with the degree of co-operation that existed there between industry and science. He became convinced that the United States would benefit greatly from some plan that would assist manufacturers in employing scientific technology in place of the traditional, rule-of-thumb production methods then in general industrial use. The Industrial Fellowship System gradually took shape in his mind. In 1907, while professor of industrial chemistry at the University of Kansas, he had the first opportunity to submit his system to practical test and he proved it a success. Duncan came to the University of Pittsburgh in 1910 at the request of the Mellon brothers, who had learned about his work at Kansas, to serve as professor of industrial chemistry and as director of industrial research. Operation of the industrial fellowships was begun in Pittsburgh in 1911.

Fellowships and their Results

The Mellon brothers followed this Pittsburgh experiment with great interest. They soon became convinced that the system was sound and beneficial as a direct aid to humanity through industrial research and by training young men for productive careers in research. In consequence of this interest they founded the Institute in 1913 and authorised Duncan to design and erect a modern headquarters with adequate laboratory facilities. Duncan lost no time, but died in 1914 prior to the completion of the building, which was dedicated a year later. As a director he was succeeded by Raymond F. Bacon, who served until 1921 in that capacity. In 1916, Edward R. Weidlein, who had been a student under Duncan at Kansas, and later an Industrial Fellow of Mellon Institute, came to the Institute as associate director, and became director in 1921.

One industrial fellowship has been in operation since the foundation of the Institute in 1911. Thirty-three of the present fellowships have been maintained continuously for five years or more, and of this number fifteen have been active for ten years, eleven have concluded fifteen years or more of research, and seven fellowships are twenty years of age or older. The money appropriated by donors in support of industrial fellowships in the past twenty-six years amounts to nearly eleven and a half million dollars. Most of the problems studied by the Institute since its foundation have been solved satisfactorily, and in the period it has aided a total of almost 4,000 American companies, either as individuals or as members of associations. Its contributions to the literature of chemistry and allied sciences for the benefit of all include 19 books, 143 bulletins, 744 research reports, and 1,117 miscellaneous papers published in journals. A total of 669 United States patents have also been granted as a result of the work which has been done at the Institute.

Since 1911, Mellon Institute has had 1,150 industrial fellowships on 279 different subjects of technology, on which as many scientists and engineers have been employed. About 650 novel processes and products have been invented or developed. In ten instances, fellowship inventions have created new industries. Shortly after the Institute was organised, a fellowship was founded to study acetylene. Acetylene lighting then was important; electricity had not yet displaced it from the automobile. It was found in the course of this fellowship's work that ethylene could be made cheaply by a new process. Ultimately, a new chemical corporation was formed to put these various compounds into channels of commerce. The synthesis of various compounds from hydrocarbons of natural gas and crude petroleum, as practised by this company, came basically from processes worked out by the fellowship, and more than 130 different chemicals of value are being made by these methods—among them an anesthetic, an anti-freeze material for motor cars, dye solvents, chemicals used in textile finishing, a fumigant, and an array of vinyl resins for use in paints, varnishes, linoleum, oilcloth and in the electrical and automobile industries, as well as building.

Outstanding Commercial Developments

The chrome-plating of aluminium was developed to commercial applicability at the Institute. A well-known yeast food, several new insecticides, butane gas for metal-cutting operations, a widely-used dental cement, a moth-proofing agent, can be likewise accredited to fellowship researches. Other results have included improvements in the technology of organic rubber accelerators, the working out of a vanadium catalyst for the manufacture of sulphuric acid, better types of refractories, a new process for the recovery of cuprous sulphide from copper, a novel heat-insulating material, a series of vegetable adhesives, better varnishes and lacquers, perfection of sodium metaphosphate as a boon to laundering and mechanical dishwashing, a new iodine antiseptic, a novel core binder for foundry use, and a shoe leather impregnated chemically to make it highly scuff-resisting, better wearing, and capable of polishing by merely rubbing with a cloth.

Special refractories for the zinc industry and other metallurgical purposes, and for the making of glass, have been developed. One study led to a better alloy steel for safety-razor blades. Recent investigations have dealt with physical and chemical improvement of glass, efforts to make porcelain enamels more rugged, standards set for routine testing of razor-blade steel, development of a stainproof wall and floor tile, perfection of plasticised sulphur as a bonding compound in highway construction and for use as road markers. Since its inception, the work in pure science has also grown steadily in importance and scope.

British Overseas Chemical Trade in March

ACCORDING to the Board of Trade returns for the month ended March 31, 1937, exports of chemicals, drugs, dyes and colours were valued at £2,124,144, as compared with £1,789,218 for March, 1936, an increase of £334,926. Imports were valued at £1,119,313, as compared with £1,148,600 for March, 1936, a decrease of £29,287. Re-exports were valued at £39,904.

Imports

	Quantities. March 31, 1936.	Quantities. March 31, 1937.	Value. March 31, 1936. £	Value. March 31, 1937. £
Acids—				
Acetic .. .. cwt.	16,477	13,555	21,981	14,995
Boric (boracic) .. ,,	3 100	8,030	3,099	8,140
Citric .. .. ,,	3,299	1,982	11,925	7,881
Tartaric .. .. ,,	3,958	4,455	16,080	18,385
All other sorts .. value	—	—	9,149	6,548
Borax .. .. cwt.	11,403	28,609	7,103	14,598
Calcium carbide .. ,,	117,135	106,761	62,491	57,679
Fertilisers, manufactured—				
Superphosphate of lime tons	7,892	5,181	15,434	11,271
All other descriptions ,,	4,518	1,481	24,071	8,094
Phosphorus .. cwt.	—	5	—	20
Potassium compounds—				
Caustic and lyes ,,	10,718	12,145	11,923	13,517
Chloride (muriate) ,,	55,502	35,040	17,450	10,919
Kainite and other mineral fertiliser salts .. cwt.	210,935	116,148	27,350	14,360
Nitrate (saltpetre) ,,	40,539	9,772	14,548	5,899
Sulphate	27,690	12,960	11,352	5,795
All other compounds ,,	13,811	9,453	19,263	12,193
Sodium compounds—				
Carbonate, including crystals, ash and bicarbonate .. .. cwt.	177	5,000	232	1,195
Chromate and bichromate cwt.	1,700	4,133	2,353	4,585
Cyanide .. .. ,,	5,559	4,679	13,943	10,908
Nitrate .. .. ,,	119,000	40,280	33,199	8,701
All other compounds ,,	15,372	24,618	17,634	18,464
Other chemical manufactures .. .. value	—	—	321,014	345,960
Drugs, medicines and medicinal preparations—				
Manufactured or prepared—				
Quinine and quinine salts oz.	182,146	105,086	14,378	9,064
Medicinal oils .. cwt.	2,743	7,888	9,449	23,078
Proprietary medicines value	—	—	44,546	50,307
All other sorts	—	—	56,342	42,507
Dyes and extracts for tanning—				
Finished dye-stuffs obtained from coal tar cwt.	3,605	4,600	111,910	130,151
Extracts for dyeing ,,	4,601	6,460	8,938	12,692
Extracts for tanning (solid or liquid)—				
Chestnut .. .. cwt.	22,356	32,115	15,124	21,626
Quebracho .. ,,	37,152	32,111	31,789	30,083
All other sorts .. ,,	29,272	38,953	22,543	28,179
All other dyes and dye-stuffs cwt.	1,165	541	21,933	11,802
Painters' colours and materials—				
White lead (basic carbonate) .. .. cwt.	7,227	7,335	9,254	10,842
Lithopone .. ,,	20,966	22,269	13,342	14,187
Ochres and earth colours cwt.	38,947	41,238	21,940	13,562
Bronze powders .. ,,	1,837	2,411	11,212	17,268
Carbon blacks .. ,,	35,838	39,336	52,403	56,646
Other pigments and extenders.. .. cwt.	32,406	48,431	8,618	11,269
All other descriptions ,,	15,363	16,404	33,285	36,243
Total .. .. value	—	—	1,148,600	1,119,313

Exports

	Quantities. March 31, 1936.	Quantities. March 31, 1937.	Value. March 31, 1936. £	Value. March 31, 1937. £
Acids—				
Citric .. .. cwt.	2,364	2,082	9,961	9,353
All other sorts .. ,,	—	—	21,023	21,951
Aluminium compounds tons	2,722	2,886	35,363	27,973
Ammonium compounds—				
Sulphate .. .. tons	10,758	20,611	63,781	127,391
All other sorts .. ,,	1,472	1,048	15,837	13,198
Bleaching materials—				
Bleaching powder (chloride of lime) .. cwt.	41,322	51,790	11,319	14,164
All other sorts .. ,,	9,098	6,442	20,334	17,536
Coal tar products—				
Cresylic acid .. galls.	251,447	252,372	25,342	40,704
Tar oil, creosote oil, anthracene oil .. galls.	2,465,766	3,357,752	56,064	88,822
All other sorts .. value	—	—	20,564	23,397
Copper, sulphate of cwt.	5,904	3,602	85,318	71,860
Disinfectants, insecticides, weed killers .. cwt.	27,018	31,830	60,750	65,446
Fertilisers, manufactured tons	18,920	39,911	61,367	97,792
Glycerine .. .. cwt.	13,855	22,597	32,747	79,645
Lead compounds .. ,,	13,580	17,956	18,021	30,037
Magnesium compounds tons	498	474	11,544	10,942
Potassium compounds cwt.	5,493	7,036	10,071	12,547
Salt (sodium chloride) tons	17,535	18,747	44,600	60,121
Sodium compounds—				
Carbonate, including crystals, ash and bicarbonate .. .. cwt.	400,030	441,721	93,550	83,005
Caustic .. .. ,,	179,896	168,545	82,466	74,759
Nitrate .. .. ,,	13,026	931	4,240	356
Sulphate, including saltcake .. .. cwt.	46,890	19,384	4,510	2,267
All other sorts .. ,,	60,584	74,654	88,212	75,979
Zinc oxide .. .. tons	856	1,269	15,692	27,753
All other descriptions value	—	—	214,399	219,463
Drugs, medicines and medicinal preparations—				
Quinine and quinine salts oz.	93,463	195,632	11,113	16,796
Proprietary medicines value	—	—	130,094	147,030
All other descriptions value	—	—	126,280	139,773
Dyes and extracts for tanning—				
Finished dye-stuffs from coal tar—				
Alizarine, alizarine red and indigo (synthetic) cwt.	2,243	2,493	15,538	13,635
Other sorts .. ,,	7,016	8,498	90,465	116,364
Extracts for tanning (solid or liquid)	20,325	26,772	17,066	22,188
All other descriptions ,,	1,632	2,450	5,901	12,465
Painters' colours and materials—				
Ochres and earth colours cwt.	13,151	15,970	13,894	15,610
Other descriptions ,,	26,231	22,436	31,534	33,709
White lead .. ,,	6,144	5,330	12,702	12,625
Paints and enamels, prepared .. .. cwt.	35,064	52,341	95,505	132,891
Varnish and lacquer (clear) .. .. galls.	73,472	76,365	28,201	29,123
Printers' ink .. cwt.	4,173	3,961	25,497	26,339
All other descriptions ,,	38,135	53,382	78,353	109,135
Total .. .. value	—	—	1,789,218	2,124,144

Re-Exports

Chemical manufactures and products .. .. value	—	—	27,831	20,130
Drugs, medicines and medicinal preparations cwt.	—	—	7,794	13,270
Dyes and extracts for tanning .. .. cwt.	1,608	4,467	1,976	5,38
Painters' colours and materials .. .. cwt.	250	612	960	1,121
Total .. .. value	—	—	38,561	39,904

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ANALYSIS.—The determination and estimation of acids and bases in cellulosic fibres. H. Tatu, *Rev. Univ. Soie Text. Artificiels, 13,* 73-79.

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Chemical Notes from Foreign Sources

Greece

A PERMIT FOR THE ERECTION OF A NITROGEN WORKS has been granted to the firm of Strongulos and Papadopulos.

Japan

INVESTIGATIONS ON THE PRODUCTION OF PURE ALCOHOL from potatoes have been commenced under the auspices of the Korean Government.

Poland

AN ACUTE SHORTAGE OF PHENOL is reported on the Polish market. Gasworks are urged to interest themselves in the production of phenol which is isolated (on a limited scale) only by the Warsaw Municipal Gas Co.

Russia

FIFTY THOUSAND CINCHONA TREES have been planted on State property in Abchasia.

A PROCESS FOR RECOVERING SILICON CARBIDE from used abrasive wheels has been evolved at the Iljitseh Abrasive Works.

A CARBON BISULPHIDE PLANT IS BEING BUILT at the chemical combinate in Czelkowsk, using an electrothermic continuous process instead of the previously employed retort process.

Czechoslovakia

PRODUCTION OF SYNTHETIC TANNING AGENTS is under consideration by the Bata concern.

SOAP MANUFACTURE WAS RECENTLY COMMENCED at Pecek by the Agricultural Co-operative Associations.

TESTS WITH CASEIN ARTIFICIAL WOOL made by the Italian Lanital process have not fulfilled expectations and the project is now understood to have been abandoned.

OWING TO THE UNSATISFACTORY DEMAND for radium, very drastic restrictions in the production programme at the State Mines at Joachimstal are announced, the world price in recent years having fallen below the cost of production in Czechoslovakia and a loss of 4.3 million kronen being anticipated for 1937.

Germany

THE I. G. FARBENINDUSTRIE will hold its annual meeting on May 8, 1937, when distribution of a dividend of 7 per cent. will be proposed. The net profit in 1936 rose to 55½ million marks as compared with 51½ million marks.

LARGE-SCALE VEGETABLE CASEIN MANUFACTURE has been started by F. Thörl's Vereinigte Harburger Oelfabriken A.-G. at their works in Harburg-Wilhelmsburg. The product is intended to replace milk casein as a plywood adhesive.

SCHIMMEL AND CO. closed the year 1936 with a net profit of nearly 320,000 marks as compared with 290,000 marks in the previous year, and is paying a dividend of 11 per cent. (10 per cent. previously) on the current share capital of 2.93 million marks.

THE REPORT OF THE I. G. FARBENINDUSTRIE for 1935 states that in dyestuffs and dyeing assistants the turnover was greater both in quantity and value. A series of new medicinal products have been marketed following research work at the laboratories in Elberfeld, Höchst and Marburg. These include Iliren (a suprarenal gland preparation), Manetol (a standardised injectable styptic), and Torantil (for treatment of certain allergic conditions). A notable result of vitamin research was the synthesis of the antineuritic vitamin B_1 (Betaxin). Progress was made in the field of colour photography as represented by the new Agfa colour film. Manufacture of a new fertiliser on a lime-urea basis was commenced in November, 1936. Increased sales of Leuna petrol were effected, and promising results in the production of other hydrogenated products were achieved.

Italy

HYDROGENATION OF ALBANIAN CRUDE OIL is being carried out on a semi-technical scale at Novara with satisfactory yields of petrol and lubricating oil.

Belgium

S.A. DES PRODUITS CHIMIQUES BELGA, of Brussels, newly registered with a capital of 375,000 francs, will engage in the production of materials for the textile, leather and paper industries.

China

A NEW REAGENT FOR PRIMARY AND SECONDARY AMINES, 3-nitro benzazide, has been studied by Meng and Sah ("J. Chinese Chem. Soc.," 1936, No. 2, p. 75). It forms well-defined substituted areas with amines on moderate heating.

Estonia

A FACTORY FOR MAKING ABSOLUTE ALCOHOL is now being built in Wesenberg and is expected to turn out 10,000 hectolitres of pure alcohol per annum. Agricultural interests have again raised the question of compulsory blending of alcohol with motor spirit, a measure which would be opposed by the shale oil industry.

France

NEW COMPANY'S REGISTRATIONS include:—Société des Produits Chimiques Boucher, 3, rue Auguste-Simon, Maisons-Alfort (Seine), capital 80,000 francs (chemical products); Société le Carbone-Lorraine, 37-41, rue Jean-Jaures, Gennevilliers (Seine), capital 53 million francs (electrode carbons).

THE ADVANTAGES OF CHLOROPICRIN as an insecticide and vermicide in granaries are discussed by Professor Gabriel Bertrand in the March issue of "Chimie et Industrie." Large-scale tests have been carried out since 1935 and amply prove that chloropicrin is without deleterious action upon wheat gluten.

Dyes from Birds' Feathers

A Moscow Experiment

PROFESSOR P. MANTEIFEL, of the Moscow Zoological Gardens, in a recent issue of "Izvestia" tells of an interesting experiment carried out at the Zoo in obtaining a dye from the bright red feathers of the banana bird. It has been known for a long time that the bright red feathers of these birds fade to a pale pink when exposed to tropical rain. The later discovery that ammonia dissolved the pigment of the feathers explained the reason. The first tropical rain dissolves the ammonia contained in the air, and the effect of the ammoniac in the raindrops is to wash out the bright colour of the feathers.

At the Moscow Zoo an experiment was tried in immersing some moulted feathers from two banana birds in water containing a weak solution of ammonia. On the following day the feathers were practically bleached, while the water had turned to a bright red. The feathers were put out in the sun to dry, and during the drying process, curiously enough, their bright red colour was restored. The solution of red pigment has been preserved at the Moscow Zoo for two years, and still retains its vivid hue. Attempts were made to dye various pieces of fabric and paper in a strong solution of the pigment, which has turned out to be an excellent, fast dye, withstanding exposure to the brightest sunlight.

Professor Manteifel makes the suggestion that chemists should find out the composition of this pigment to obtain this fast and organically red dye by a synthetic process. He is of the opinion that a more profound study of the bright pigments of feathers and insects would be helpful for inventing new types of dyes.

From Week to Week

ENTRIES CLOSE NEXT TUESDAY MORNING FOR THE CHEMICAL AGE Lawn Tennis Tournament. Read the rules in page 388, and send your entries at once to avoid disappointment.

A DEMONSTRATION of the fire-resisting qualities of timber when treated with "Faspos," a product of Imperial Chemical Industries, Ltd., was given last week at the Temple Saw Mills of Robinson Dunn and Co., Ltd., at Glasgow.

THE MODERN COKE-OVEN PLANT erected at Seaton Carew, West Hartlepool, for the South Durham Steel and Iron Co., Ltd., has been completed, and on April 22, the first fires were lit up by Mr. A. N. McQuistan, managing director of the firm. The ovens have been built by Gibbon Brothers, of Dudley.

AN UNSUCCESSFUL ATTEMPT has been made by the 250 employees of the Marley Hill chemical works to persuade the owners (John Bowes and Partners, Ltd.), to reconsider their decision to close the works in September. The owners have decided to adhere to their original decision on the grounds that the works are obsolete and too costly to carry on.

A COURSE OF THREE special university lectures on "The Chemistry of the Carotenoids and Vitamin A" will be given under the auspices of the London University at the Imperial College of Science and Technology on May 24, 25 and 26 by Professor I. M. Heilbron. Admission will be free without ticket. Professor J. F. Thorpe will preside at the first lecture.

THE COAL-OIL PLANT at Seaham erected two years ago for Coal and Allied Industries, Ltd., which has been idle three months is to be sold by tender by order of the receiver for the debenture holders. The property to be sold comprises the whole of the carbonising and distilling plant. The plant includes 17 welded steel storage tanks of a total capacity of 1,900,000 gals.

A REPRESENTATION has been made to the Board of Trade under Section 10(5) of the Finance Act, 1926, for the exemption of di-glyceryl tetra acetate from Key Industry Duty. Any communications should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, London, S.W.1, not later than May 21.

THE IMPORT DUTIES ADVISORY COMMITTEE has under consideration a proposal for the removal from the free list of diatomaceous earth as quarried. Any representations which interested parties may desire to make should be addressed in writing to the Secretary, Import Duties Advisory Committee, Shell-Mex House, Strand, London, W.C.2, not later than May 20.

NOBEL'S EXPLOSIVES FACTORY at Linlithgow re-opened on Monday as a munition factory. At the commencement a skeleton staff of workmen is being employed, but when work is in full swing there will be employment for 600 men in three shifts. The factory was closed about a year ago and the manufacturing interests transferred to Stevenston, Ayrshire. Since last November, however, the factory has been reconstructed at a cost of £15,000.

OVER 100 PRESENTATIONS were made at the Ardeer Factory last week to employees of Imperial Chemical Industries, Ltd., for long service. These included chiming clocks to retired workers with over 40 years' service, gold medals to those with 40 years' service, gold watches for 35 years, and silver watches and medals for 25 years' service. The function at which the gifts were handed over was attended by 300 persons and the guest of honour was Lord McGowan.

A NEW VOLUME entitled "The Mineral Position of the British Empire," which should be of service to all concerned with questions or inter-imperial mineral and metal trade, has been published by the Imperial Institute. The book deals with the status of the mineral industry and mineral resources of the Empire. It reviews the changes that have taken place in each Empire country during recent years and compares the mineral outputs of the various countries with each other and with the world in general. Detailed statistics show sources of imports and destinations of exports for raw minerals and mineral products.

EXPERIMENTS EXTENDING OVER FIVE YEARS with colloidal fuel have been completed at Wallsend by the Wallsend Slipway and Engineering Co., Ltd., in conjunction with the Cunard Line of Liverpool. It is understood the fuel has reached a stage of economical commercial production. The fuel consists of 60 per cent. crude oil and 40 per cent. pulverised fuel. During the experiments coal was used from Durham, Northumberland, Yorkshire, Derbyshire, South Wales and Lancashire with success, while the Cunard Liner "Berengaria" also took part. The fuel is stated to be appreciably cheaper than ordinary oil fuel and this factor it is hoped will persuade shipowners to adapt their ships to its use. As colloidal fuel is in liquid form, it is not thought that extensive alterations would be necessary to convert the present oil-burning ships to its use. The plant at Wallsend where experiments have been carried on is not capable at present of making the fuel on a commercial basis. Considerable extensions would be necessary. It is understood negotiations may be started soon with coal and oil interests to make the new fuel.

CONTROL OF THE CANADIAN INDUSTRIAL ALCOHOL CO., LTD., is understood to have been acquired by Hiram Walker-Gooderham and Worts, Ltd., by virtue of the purchase of the shares held by the estate of the late Sir Mortimer B. Davis at $8 a share.

RESOLUTIONS REDUCING THE CAPITAL of Associated Dyers and Cleaners, Ltd., from £1,300,000 to £775,000 by writing down the £1 ordinary shares to 1s., and by returning to holders of the £1 preference shares 2s. in cash, were approved at special meetings held on April 23. A further resolution increasing the capital to £1,300,000 by the creation of 525,000 unclassified shares of £1 was also passed.

DAMAGE ESTIMATED AT SEVERAL HUNDRED POUNDS was caused by fire at the works of the Cornbrook Chemical Co., Newbridge Lane, Stockport, on Sunday. The watchman found a colour-drying stove on fire in the main building, which was heavily stocked with inflammable colour materials. Flames were shooting through the roof when the firemen arrived, but they were able to prevent the outbreak from spreading.

MANURING FOR PROFITABLE PRODUCTION is the subject of a brochure which Mr. F. E. Corrie, B.Sc. (Agric.), has prepared for British Glues and Chemicals, Ltd. The aim of the brochure is to present to farmers and market gardeners in concise form recommendations for the fertiliser treatment of crops and to provide them with some information about bone fertilisers which, in these days of mass production, tend to be neglected by official experimenters.

A FURTHER NINETEEN OIL PROSPECTING LICENCES under the Petroleum (Production) Act, 1934, and the Petroleum (Production) Regulations, 1935, have been issued by the Board of Trade. Ten of these have been granted to the D'Arcy Exploration Co., Ltd., and cover a total area of approximately 1,649 square miles in Kent, Sussex, Surrey, Yorkshire, Notts, Derbyshire, Staffordshire, Shropshire and Cheshire. The other nine licences have been issued to the Gulf Exploration Co. (Great Britain), Ltd., and cover about 1,277 square miles in Kent, Sussex, Dorset, Wilts, Somerset and Yorkshire.

SALT UNION, LTD., has received an offer from Imperial Chemical Industries, Ltd., for the whole of its issued capital. For each £1 of the 7 per cent. non-cumulative and participating preference stock of Salt Union, Ltd., there is offered in exchange £1 13s. 4d. 7 per cent. cumulative preference stock of Imperial Chemical Industries. For each £1 of ordinary stock there is offered £1 10s. ordinary stock. The preference and ordinary stock of I.C.I. to be issued in this way will carry a dividend from January 1 last. This proposal amounts to an offer of £5 of I.C.I. preference stock for £3 of Salt Union and £3 I.C.I. ordinary stock for £2 Salt Union.

A STIPULATION that the starch content of potatoes supplied to the new Irish Free State alcohol factory at Riverstown should be 16 per cent., is being resisted by the growers. Cooley Potato Growers' Association has decided not to sign contracts for supplying the factory during the 1937-38 season until their committee came to an agreement with the factories. The Association demands that the content shall be 14 per cent. An appeal has been made to growers in other counties to support the demands. It was stated at a recent meeting of the Association that Arran Beg and Arran Consul, the two varieties of potatoes most grown in the Riverstown areas, could not yield 16 per cent. starch, and that the deliveries already made yielded a maximum of 14.8 per cent.

Personal Notes

MR. C. C. PATERSON, director of the research laboratories of the General Electric Co., Ltd., will receive the honorary degree of Doctor of Science at the annual degree ceremony at Birmingham University on July 3.

MR. W. T. STIRLING has resigned his appointment as chief chemist and works manager to William Briggs and Sons, Ltd., Dundee, which he has held for the past 14 years. He is going into business on his own account as a bitumen specialist.

MR. T. WALTON has relinquished his seat on the board of Barrow, Hepburn and Gale, Ltd., and Mr. G. W. Odey has been appointed chairman in his place. Mr. W. R. Box, who has for many years been in the service of the company, has now joined the board.

MR. H. R. PHILLPOTTS, assistant superintendent of public works, Jamaica, has received a grant from the trustees of the Carnegie Corporation of New York, for a course of study in water purification and chlorination in the United Kingdom, as one of the selected officers of the colonial service who are to spend a period of absence of one year or less from their official duties, by permission of the Secretary for the Colonies, in study, research or travel. The fund from which this grant has been made was set aside by the Carnegie Corporation in May, 1932, and an additional contribution was made to it in 1936.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

(NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

ENGLISH CLAYS LOVERING POCHIN AND CO., LTD., St. Austell. (M., 1/5/37.) April 20, £265,370 8/11 mortgage, to C. A. Phillimore, Burford (Oxon.) and others; charged on china clay, stone, metals and minerals, etc., and lands and premises in parish of St. Stephen-in-Branwell and elsewhere, and the benefit of certain agreements, etc. *£116,660. Feb. 24, 1937.

TAYLOR, BRAWN AND FLOOD, LTD., Bedford, chemists, etc. (M., 1/5/37.) April 20, charge, to Westminster Bank, Ltd., securing all moneys due or to become due to the Bank; charged on premises in High Street, Sandy. *£3,424. Aug. 14, 1936.

Satisfaction

UNITED GLASS BOTTLE MANUFACTURERS, LTD., London, W.C. (M.S., 1/5/37.) Satisfaction April 15, of charge registered October 12, 1925.

County Court Judgments

(NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court Judgments against him.)

CRIMES, ROBT., 24 West Leake Road, East Leake, works chemist, and Crimes, Kathleen (his wife). (C.C., 1/5/37.) £16 4s. 2d. March 10.

KELLY, LESLIE K., 224 Burnley Road, Huncoat, colour chemist. (C.C., 1/5/37.) £39 3s. 5d. March 8.

Companies Winding-up Voluntarily

THE SOUTH WALES SOAP CO., LTD. (C.W.U.V., 1/5/37.) By reason of its liabilities April 15, 1937, Mr. C. Gordon Joliffe, of Parsons and Joliffe, chartered accountant, 45 Chepstow Road, Newport, appointed liquidator. At a subsequent meeting of creditors, the following resolution was passed: "That Mr. Alfred Ernest Clutterbuck, of 31 Queen Street, Cardiff, chartered secretary, be appointed liquidator of the above company, with a committee of inspection."

Forthcoming Events

LONDON.

May 3.—Society of Chemical Industry. (London Section and Plastics Group). Joint meeting with the Oil and Colour Chemists' Association. Symposium on "The Mechanism of Solid Film Formation." 2.45 p.m. and 5.30 p.m. Science Museum, South Kensington.

May 5.—Society of Glass Technology. "Modern Illumination." Dr. J. English. 7.30 p.m. Holophane, Ltd. Elverton Street, S.W.1.

May 5.—Institute of Fuel. "Fuel Economy in Melting and Re-Heating Furnace for Steel Works." R. J. Sarjant. 6 p.m. Library of Royal Society of Arts, Adelphi.

May 5.—Institute of Chemistry. (London and South-Eastern Counties Section). Visit to Sewage Works, Morden.

May 5.—Institute of Metals. Twenty-seventh annual May lecture. 8 p.m. Institution of Mechanical Engineers, Storey's Gate, Westminster.

May 5.—Society of Public Analysts. "The Determination of Bismuth as Phosphate." W. R. Schoeller. "The Distillation of Strong Acids." H. I. Coombs. "Resins and Pitches from Ancient Egyptian Tombs." J. G. A. Griffiths. "The Detection of Highly Hardened Oils and Mutton and Beef Fats in Butter Fat and Ghee." V. Venkakatachalam. "A New Apparatus for the more Rapid and Economical Determination of the Freezing-point of Milk." P. L. Temple. 8 p.m. Burlington House, Piccadilly.

May 5.—Royal Society of Arts. "The Fuel Supplies of Great Britain." Prof. Alfred W. Nash. 8.15 p.m. Lecture Hall, John Street, Adelphi.

May 6.—The Chemical Society. Ordinary scientific meeting. "The Oxidation of some Polyhydroxylic and Polyethylenic Higher Fatty Acids by Aqueous Alkaline Permanganate Solutions." T. G. Green and Prof. T. P. Hilditch. "Formaldehyde Condensations with Aliphatic Ketones. Part II. Methyl Ethyl Ketone." Sir Gilbert T. Morgan and C. F. Griffith. "Liquid Phase Reactions at High Pressures. Part I. Hydrolysis of Esters and the Knoevenagel Reaction." Dr. D. M. Newitt, Dr. R. P. Linstead, R. H. Sapiro, and Dr. E. J. Boorman. 8 p.m. Burlington House.

BIRMINGHAM.

May 4.—Electrodepositors' Technical Society. "Electrodeposition of Alloys." L. Wright. 7.30 p.m. James Watt Memorial Institute, Great Charles Street, Birmingham.

BELFAST.

May 3.—Institute of Chemistry of Great Britain and Ireland. Annual general meeting. 7.30 p.m. Royal Belfast Academical Institution.

Company News

A. Boake Roberts.—An interim of 1 per cent., tax free (same), on ordinary shares is announced.

Benzole and By-Products.—The report for the year to September 30 shows net profit £4,902 (against loss £2,416), which, deducted from debit brought in, £134,385, leaves debit forward £129,483.

Greeff-Chemicals Holdings.—A final dividend on the ordinary shares has been announced at 6½ per cent., less tax, for the period June 12 to December 31, 1936 (representing dividend of 11.72 per cent., less tax, per annum).

Creole Petroleum Corporation.—The report for 1936 shows that consolidated net income was $8,596,448, equivalent to $1.23 (80.79) per share on common stock outstanding. Crude oil sold was about 11 per cent. greater than in 1935, and total sales value increased by slightly more than 21 per cent. Total dividend 50c. per share (20c.).

Unilever.—The directors have resolved to recommend to the annual general meeting, which will be held on May 5, a final dividend on the ordinary stock of the equivalent in sterling of 36 Dutch cents per £1 of stock, payable on May 26, to ordinary stockholders on the books on May 2. The amount in sterling of this dividend will be fixed on May 5 by reference to the sterling rate of exchange on Amsterdam on that day.

New Companies Registered

Bestwyn Manufacturing Co., Ltd., 42 Cornhill, E.C.2.—Registered March 12. Nominal capital, £6,000. Manufacturers of and dealers in chemicals, chemical products and by-products, abrasive papers, medicines, etc. Subscribers: John S. Waters and A. Shelley.

Piggott Kempton and Houghtons, Ltd.—Registered April 10. Nominal capital £1,000. Dyers, dry cleaners, finishers, makers of vitriol, chemicals and dyeing materials, preparers and manufacturers of and dealers in wool, fur, silk, cotton and all other substances in a raw or manufactured state, etc. Directors: Reginald G. Houghton, Market Square, Ely, Cambs, W. T. Kempton and H. C. Houghton.

British Coanda Developments, Ltd.—Registered March 20. Nominal capital £30,000. To acquire from Societe Anonyme d'Etudes des Brevets et Procedes Coanda and Henri Coanda a licence in respect of certain British Empire Patent Rights, and to carry on the business of manufacturing, research and general chemists, dealers in all kinds of chemical products, substances and processes, engineers, machinists, metallurgists, founders, etc. Subscribers: C. H. Priestley, 18 Austin Friars, E.C.2., and G. F. Shipman.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Egypt.—The Commercial Counsellor to H.M. Embassy at Cairo reports that the Egyptian Ministry of Public Works (Mechanical and Electrical Department) are inviting tenders for the supply of ice-making plant for the Egyptian Irrigation Department, Khartoum. Conditions of tender and specifications can be obtained from the Office of the Chief Inspecting Engineer, Egyptian Government, 41 Tothill Street, London, S.W.1, on payment of 3s. per set.

Inventions in the Chemical Industry

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Specifications Open to Public Inspection

PRODUCTION OF PARAFFIN-WAX EMULSIONS.—E. E. Mayer. Oct. 12, 1935. 33187/35.

SIZING OF PAPER and like materials.—E. E. Mayer. Oct. 7, 1935. 33188/35.

METHOD OF AND MEANS FOR TREATING FUEL GASES.—Koppers Co. of Delaware. Oct. 9, 1935. 10050/36.

METHOD FOR THE PRODUCTION OF COLLOIDAL SULPHUR IN THE DRY STATE and at different degrees of concentration.—E. Boulogne, Soc. Industrielle des Derives du Soufre. Oct. 7, 1935. 22550/36.

PROCESS FOR DYEING PELTS, HAIRS AND FEATHERS.—I. G. Farbenindustrie. Oct. 12, 1935. 24594/36.

MANUFACTURE AND PRODUCTION OF CHROMITE REFRACTORIES.—G. E. Seil. Oct. 10, 1935. 25960/36.

PROCESS FOR THE PRODUCTION OF PHENOL-FORMALDEHYDE CONDENSATION PRODUCTS.—Pollopas Patents, Ltd. Oct. 7, 1935. 26354-5/36.

INSOLUBLE COLOURED PRODUCTS OR PIGMENTS, and process for manufacturing the same.—Soc. de Produits Colorants et Plastiques. Oct. 8, 1935. 26574/36.

MANUFACTURE OF COLD SWELLING AND COLD SOLUBLE STARCH.—W. A. Scholten's Chemische Fabrieken N.V. Oct. 7, 1935. 26987/36.

METHOD OF MANUFACTURING SYNTHETIC RESIN.—Ajinomoto Houps Kabushiki Kaisha Luzuki Shoten. Oct. 12, 1935. 27091/36.

PROCESS FOR THE MANUFACTURE OF REDUCTION PRODUCTS derived from dehydroandrosterone.—Schering-Kahlbaum, A.-G. Oct. 7, 1935. 27133/36.

PROCESS FOR THE STABILISATION OF CELLULOSE ESTERS.—Afag Finanzierungs, A.-G. Oct. 9, 1935. 27426/36.

PROCESS FOR DETERMINING THE EXCESS AMOUNT OF OXIDISING-AGENT IN CHEMICALLY PURIFIED WATER.—A. Schnorf. Oct. 9, 1935. 27448/36.

DEPOSITION OF METALLIC FILMS from metal vaporised in vacuo.—P. Alexander. Oct. 12, 1935. 27524/36.

PROCESS OF HIGH-VACUUM DISTILLATION.—Eastman Kodak Co. Oct. 10, 1935. 27534/36.

PROCESS FOR THE PREPARATION OF ALKALINE SILICATE.—Montecatini Soc. Generale per L'Industria Mineravia and Agricola Oct. 12, 1935. 27637/36.

PRINTING AND COLOURING OF TEXTILE and like materials.—E. I. Du Pont de Nemours and Co. Oct. 10, 1935. 27659/36.

PROCESS FOR THE PRODUCTION OF CELLULOSE ESTERS.—Afag Finanzierungs, A.-G. Oct. 10, 1935. 27690/36.

CARRIERS FOR CATALYSERS, and processes for the manufacture thereof.—O. Vieli. Oct. 11, 1935. 27697/36.

CONVERSION OF HYDROCARBON OILS.—Universal Oil Products Co. Feb. 18, 1935. 10238/37.

Specifications Accepted with Date of Application

PRODUCTION OF BUTYL ALCOHOL and other products by fermentation.—W. A. Burton (Commercial Solvents Corporation). July 4, 1935. **463,718.**

PROCESS FOR CONTROLLING HYDROGEN ION CONCENTRATION OF FERMENTATION MASHES.—W. A. Burton (Commercial Solvents Corporation). July 4, 1935. 463,719.20.

CHARCOAL-MAKING PLANTS.—L. H. A. Dunker. July 5, 1935. 463,721.

PRODUCTION OF HIGHER BOILING HYDROCARBONS from olefines.—International Hydrogenation Patents Co., Ltd. Aug. 4, 1934. 463,791.

UTILISATION OF COLLIERY SHALE and other waste bituminous shales.—N. V. S. Knibbs, and A. P. Pehrson. Aug. 8, 1935. 463,942.

DISTILLATION OF COAL and similar substances.—P. Landon. Oct. 6, 1936. 463,792.

PRESERVATION OF LIQUIDS.—W. Matzka. Aug. 29, 1935. 463,794.

EVAPORATORS.—Babcock and Wilcox, Ltd., and E. L. Luby. Sept. 3, 1935. 463,727.

CLOSING OF BOTTLES or other receptacles.—D. Traill, and Imperial Chemical Industries, Ltd. Sept. 5, 1935. 464,025.

VULCANISATION ACCELERATORS.—W. Baird, G. E. Nettleship, and Imperial Chemical Industries, Ltd. Sept. 6, 1935. 464,026.

TREATMENT OF CELLULOSE ESTER THREADS, RIBBONS, FILMS, FABRICS, and like materials.—British Celanese, Ltd., R. W. Moncrieff, and C. W. North. Oct. 5, 1935. 463,955.

PRODUCTION OF ALBUMINOID or protein material.—J. C. Kernot. Oct. 7, 1935. 463,872.

DISTILLATION OF SHALE, COAL and like materials.—A. Lovell, W. J. Biddles, and M. A. Linn. Oct. 7, 1935. 463,875.

PRODUCTION OF STABILISED BENZINE in the destructive hydrogenation of distillable carbonaceous materials.—H. E. Potts (International Hydrogenation Patents Co., Ltd.). Oct. 8, 1935. 463,961.

PRODUCTION OF VALUABLE CARBONYL COMPOUNDS.—H. D. Elkington (Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij). Oct. 7, 1935. 463,959.

PREPARATION OF DIALKYL ETHERS OF GLYCOL.—Carbide and Carbon Chemicals Corporation. Nov. 9, 1934. 463,962.

PHOSPHATIDE COMPOSITIONS.—Dr. B. Rewald. Oct. 8, 1935. 464,100.

MANUFACTURE OF TITANIUM DIOXIDE and products containing titanium dioxide.—J. E. Pollak (Naamlooze Vennootschap Industrieele Maatschappij voorheen Noury and Van der Lande). Oct. 8, 1935. 463,966.

ANTI-CORROSION COATING COMPOSITIONS.—Chemische Fabric R. Baumheier, A.-G. Jan. 19, 1935. 464,101.

MANUFACTURE OF CHLORINATED RUBBER.—T. N. Montgomery, A. P. Lowes, and Imperial Chemical Industries, Ltd. Oct. 8, 1935. 463,969.

MANUFACTURE OF HALOGENATED DERIVATIVES OF METHANE.—W. W. Gleave, and Imperial Chemical Industries, Ltd. Oct. 8, 1935. 463,970.

PROCESS FOR PRODUCING WHITE-TIPPED SKINS OR FURS.—I. G. Farbenindustrie. Dec. 15, 1934. 464,034.

MANUFACTURE OF AZO-DYESTUFFS.—I. G. Farbenindustrie. Dec. 21, 1934. 464,038.

MANUFACTURE OF ALIPHATIC ACID NITRILES.—British Celanese, Ltd., H. F. Oxley, and E. B. Thomas. Oct. 10, 1935. 464,106.

MANUFACTURE OF POTASSIUM SULPHATE.—I. L. Clifford, and Imperial Chemical Industries, Ltd. Oct. 10, 1935. 464,040.

MANUFACTURE OF POLYMERISATION PRODUCTS of 2-chlorobutadiene-1. 3.—I. G. Farbenindustrie. Oct. 13, 1934. 464,053.

ADDITION OF HYDROGEN HALIDES TO ARYL ETHYLENES.—A. Carpmael (I. G. Farbenindustrie.) Oct. 11, 1935. 464,054.

PROCESS OF DYEING.—H. A. Piggott, C. S. Woolvin, and Imperial Chemical Industries, Ltd. Oct. 11, 1935. 464,110.

MANUFACTURE AND PRODUCTION OF OLEFINES from gaseous or vaporous saturated hydrocarbons.—G. W. Johnson (I. G. Farbenindustrie.) Oct. 14, 1935. 464,115.

APPARATUS FOR THE MANUFACTURE AND PRODUCTION OF GASES rich in nitrogen and free from oxides of nitrogen.—Coutts and C. and F. Johnson (Legal representatives of J. Y. Johnson (deceased)). (I. G. Farbenindustrie.) Oct. 29, 1935. 463,804.

MANUFACTURE OF TERTIARY ALKYLARYLOXY ALCOHOLS.—Rohm and Haas Co. Nov. 30, 1934. 463,991.

MANUFACTURE AND PRODUCTION OF MOTOR FUEL.—G. W. Johnson (I. G. Farbenindustrie.) Nov. 13, 1935. 463,742.

PRODUCTION OF ALKALI METAL OR AMMONIUM NITRATES.—Coutts and Co., and F. Johnson (Legal representatives of J. Y. Johnson (deceased)). (I. G. Farbenindustrie.) Nov. 25, 1935. Addition to 419,232.) 463,811.

MANUFACTURE AND PRODUCTION OF AGENTS SUITABLE FOR IMPROVING LUBRICANTS.—I. G. Farbenindustrie. Jan. 29, 1935. 463,890.

MEANS FOR DETERMINING COLOUR DENSITY OF LIQUIDS.—H. L. Marriott (H. W. Rose). Feb. 26, 1936. 464,001.

MANUFACTURE AND PRODUCTION OF CARBOXYLIC AMIDES containing free carboxylic groups and their salts.—I. G. Farbenindustrie. March 1, 1935. 463,828.

RECOVERY OF SELECTIVE SOLVENTS used in the treatment of oils. Standard Oil Development Co. Oct. 26, 1935. 463,905.

PROCESS OF PRODUCING PREPARATIONS POSSESSING ANTIRACHITIC PROPERTIES.—S. G. S. Dicker (Naamlooze Vennootschap Philips' Gloeilampenfabrieken). May 15, 1936. 464,066.

LUBRICATING-OILS.—Standard Oil Development Co. Nov. 27, 1935. 463,763.

PROCESS FOR RESOLVING SOLUTIONS OR LIQUID MIXTURES INTO THEIR CONSTITUENTS by cooling and crystallisation.—Ges. Fur Linde's Eismaschinen, A.-G., and G. A. Krause. July 10, 1935. 463,845.

PROCESS FOR EVAPORATING LIQUIDS.—Aktiebolaget Kemiska Patenter. Aug. 5, 1935. 483,770.

PROCESS FOR PREPARING ISO-OCTANE.—International Hydrogenation Patents Co., Ltd. Aug. 4, 1934. 463,851.

METHOD OF MAKING ZINC TUNGSTATE, particularly for use in fluorescent screens.—Farnsworth Television, Inc. March 13, 1935. 464,084.

MANUFACTURE OF VISCOSE RAYON.—J. G. Evans, and Imperial Chemical Industries, Ltd. Oct. 9, 1935. 464,116.

MANUFACTURE OF RUBBER COMPOSITIONS.—International Latex Processes, Ltd. Dec. 3, 1935. 463,780.

MANUFACTURE AND PRODUCTION OF AGENTS SUITABLE FOR IMPROVING LUBRICANTS.—I. G. Farbenindustrie. Jan. 29, 1935. 463,932.

PREPARATION OF LYSERGIC ACID HYDRAZIDE.—Chemical Works Formerly Sandoz. Dec. 11, 1935. 463,936.

PRODUCTION OF SOLID CARBON DIOXIDE OF HIGH DENSITY.—Ges. Fur Linde's Eismaschinen, A.-G. Jan. 14, 1936. 463,861.

CATALYST FOR CHEMICAL REACTIONS and process of producing and applying same.—A. L. Mond (Universal Oil Products Co.). Oct. 17, 1935. 463,864.

Applications for Patents

PRODUCING CATALYSTS FOR BENZINE SYNTHESIS.—Ruhrchemie, A.-G. (Germany, April 1, '36.) 8643.

MANUFACTURING HYDRAULIC GYPSUM CEMENT MATERIAL.—Rumford Chemical Works. (United States, May 14, '36.) 9012.

MANUFACTURE OF α -β-UNSATURATED KETONES of the cyclopentano-polyhydrophenanthrene series.—Schering-Kahlbaum, A.-G. (Germany, March 31, '36.) 8840.

MANUFACTURE OF β-α-UNSATURATED KETONES of the cyclopentano-polyhydrophenanthrene series.—Schering-Kahlbaum, A.-G. (Germany, March 31, '36.) 8841.

MANUFACTURE OF ALCOHOLS and derivatives thereof.—Schering-Kahlbaum, A.-G. (Germany, March 26, '36.) 8842.

PRODUCTION OF PHOSPHORIC ACID.—W. Siegel. 8736.

APPARATUS FOR DETERMINING HARDNESS OF WATER.—Soc. des Usines Chimiques Rhône-Poulenc. (United States, April 25, '3€.) 9073.

PREPARING MONATOMIC ALCOHOLS.—W. W. Triggs (Armour and Co.). 8625.

DEHYDRATION OF ALIPHATIC HYDROCARBONS.—Universal Oil Products Co. (United States, Sept. 17, '36.) 9084.

MANUFACTURE OF KETONES and alcohols from olefines.—Usines de Melle. and H. M. E. Guinot. (France, March 28, '36.) 8876.

MANUFACTURE OF CHLORIDE OF LIME.—J. Weiss. 8998.

SYNTHETIC RESINS.—Aero Research, Ltd., and R. E. D. Clark. 9316.

MANUFACTURING PYRETHRUM EXTRACT.—S. Allen and Sons, Ltd., and T. E. West. 9354.

COATING SURFACES OF IRON OR STEEL.—American Chemical Paint Co. (United States, May 12, '36.) 9729.

TREATMENT OF SURFACES OF ZINC, ETC.—American Chemical Paint Co. (United States, Nov. 30, '36.) 9730.

PRODUCTION OF OIL-SOLUBLE CONDENSATION PRODUCTS from phenols and aldehydes.—Bakelite, Ltd. (Bakelite Ges.). 9442.

MANUFACTURE OF ALDEHYDE CONDENSATION PRODUCTS.—A. G. Bloxam (Soc. of Chemical Industry in Basle.) (Oct. 8, '35.) 9883, 9884, 9885.

FUNGICIDAL COMPOSITIONS.—Boots Pure Drug Co., Ltd. 9788.

HYDROLYSIS OF TITANIUM SALT SOLUTIONS.—British Titan Products Co., Ltd. (United States, April 4, '36.) 9660.

RECOVERY OF CARBON DISULPHIDE, ETC.—Carbonisation et Charbons Actifs. (France, Feb. 27.) 9482.

MANUFACTURE OF VALUABLE CONDENSATION PRODUCTS.—A. Carpmael (I. G. Farbenindustrie.) 9311.

RENDERING TEXTILE FIBRES WATER-REPELLENT.—A. Carpmael (I. G. Farbenindustrie.) 9454.

MANUFACTURE OF VAT DYESTUFFS.—A. Carpmael (I. G. Farbenindustrie.) 9455.

MANUFACTURE OF UNSATURATED ALCOHOLS.—A. Carpmael (I. G. Farbenindustrie.) 9519.

MANUFACTURE OF AN UNSATURATED ALDEHYDE.—A. Carpmael (I. G. Farbenindustrie). 9520.

MANUFACTURE OF ARYL-RIBAMINES.—A. Carpmael (I. G. Farbenindustrie). 9666.

MANUFACTURE OF OZONES.—A. Carpmael (I. G. Farbenindustrie.) 9667.

PREPARATION OF DRIED PROTEIN PRODUCTS.—W. Clayton. 9552.

CONVERSION OF METAL ALKALI ACETATES INTO BICARBONATES.—A. Consalvo. 9240.

PRODUCING INSECTICIDES.—Cooper, McDougall and Robertson, Ltd., and R. S. Cahn. 9385.

MANUFACTURE OF ARYL-SUBSTITUTED MONO-OLEFINES, ETC.—Distillers Co., Ltd., H. M. Stanley, and J. B. Dymock. 9324.

MANUFACTURE OF CELLULOSE DERIVATIVES.—H. Dreyfus. 9483.

TREATMENT OF CLAYS.—English Clays Lovering Pochin and Co., Ltd. 9611.

MANUFACTURE OF MIXED POLYMERISATION PRODUCTS.—W. W. Groves (I. G. Farbenindustrie.) 9406.

MANUFACTURE OF SUBSTITUENTS FOR WOOL FROM VISCOSE.—W. W. Groves (I. G. Farbenindustrie.) 9408.

MANUFACTURE OF IMIDAZOLINES.—W. W. Groves (I. G. Farbenindustrie.) 9487.

MANUFACTURE OF VAT-DYESTUFFS of the 2-thionaphthene 3-indale-indigo series.—W. W. Groves (I. G. Farbenindustrie.) 9488.

MANUFACTURE OF DYESTUFFS of the triarylmethane series.—W. W. Groves (I. G. Farbenindustrie.) 9597.

PRODUCTION OF FAST DYEINGS on cellulose esters.—W. W. Groves (I. G. Farbenindustrie.) 9598.

MANUFACTURE OF MONOAZO DYESTUFFS.—W. W. Groves (I. G. Farbenindustrie.) 9719.

MANUFACTURE OF NEW POLYMERIC PRODUCTS.—I. G. Farbenindustrie. (Germany, April 3, '36.) 9521.

MANUFACTURE OF AROMATIC NITRO-AND AMINO-COMPOUNDS.—I. G. Farbenindustrie. (Germany, April 4, '36.) 9599.

MANUFACTURE OF 4-AMINOBENZENE-SULPHONAMIDE.—I. G. Farbenindustrie. (Germany, April 7, '36.) 9902.

PLASTICISED CELLULOSE ORGANIC ESTER COMPOSITIONS.—Imperial Chemical Industries, Ltd., and A. J. Watters. 9345.

PRODUCTION OF LECITHIN, ETC.—Imperial Chemical Industries, Ltd., and A. McLean. 9346.

EXTRACTION OF PROTEINS from vegetable seeds.—Imperial Chemical Industries, Ltd., S. R. Swift, and A. McLean. 9347.

COLOURATION OF LACQUERS made from cellulose derivatives.—Imperial Chemical Industries, Ltd., J. A. Radley, and F. Hill. 9348.

TREATMENT OF CELLULOSE MATERIALS.—Imperial Chemical Industries, Ltd., H. A. Piggott, and J. G. Evans. 9453.

PRODUCTION OF DERIVATIVES OF STARCH, ETC.—Imperial Chemical Industries, Ltd. 9789.

RECOVERY OF PHENOLS FROM OILS.—G. W. Johnson (I. G. Farbenindustrie). 9417.

Chemical and Allied Stocks and Shares

CONDITIONS in the stock and share markets have been dominated by uncertainty as to the incidence of the new National Defence Contribution tax, but the failure of commodity and base metal prices to show a tendency to recover from their recent sharp set-back was also an adverse factor. Industrial shares developed a rather better tendency following the further statement made by the Chancellor of the Exchequer this week with regard to the new tax, but it is felt in the market that it will be difficult to form any very definite opinion as to how individual companies will be affected until the appearance of the Finance Bill after Whitsun.

Imperial Chemicals were one of the steadier shares of companies connected with the chemical and allied trades, the assumption being that as the company had a favourable profit-earning record during the depression, the National Defence Contribution will probably not be a factor influencing prospects to any extent. As compared with a week ago the price of the shares has declined 1s. 6d. to 38s. 6d. United Molasses have declined from 33s. 9d. to 30s. 3d., and Turner and Newall from 103s. to 97s. 6d., while British Oxygen, British Plaster Board and Borax Consolidated were also shares which reacted heavily in price. These companies are among those whose profits declined sharply in the depression, and as their earnings have since responded strongly to the improvement in general trade conditions, the market view is that the new tax is a factor which may tend to make for a rather more conservative dividend policy than had recently been expected. General Refractories have also moved sharply against holders owing to an earlier assumption in the market that the new tax might bear somewhat heavily on the company, but there has been a better tendency since the official statement made by the chairman that its influence should not be very important and that it does not seem at all likely it will affect dividend prospects.

British Drug Houses held their improvement of the previous week and continued to change hands around 22s. Boots Pure Drug was another relatively steady share, although the market is now rather less inclined to talk of an increase in dividend or a share bonus for the year ended March 31. Sangers at 25s. 6d. and Timothy Whites and Taylors were other shares which had a fairly steady appearance. On the other hand, Consett Iron, Dorman Long, Richard Thomas and most iron and steel shares have declined heavily on the week, it being assumed that the new tax is a factor which is likely to make for conservative dividend payments; for as companies such as these may show considerable further expansion in earnings owing partly to rearmament work, they may have to face considerable payments in respect of the National Defence Contribution in the future.

British Glues have declined from 9s. 9d. to 8s. 6d. but British Industrial Plastics were little changed at 3s. and Greeff Chemicals Holdings at 9s. 4½d. are within a few pence of the price ruling a week ago. Salt Union have continued a strong and active feature on the offer from Imperial Chemical Industries and at 49s. 3d. they are higher on the week. Stewarts and Lloyds and Tube Investments were aided to some extent by reports that the International Steel Tube Cartel is likely to be definitely reformed in June.

Courtaulds were fairly steady and are 52s. at the time of writing, aided by the belief that the new tax is not likely to have any material influence on the current year's dividend prospects and also on the possibilities attaching to the company's "Quality Control Plan." Rayon and cotton textile shares generally were one of the steadiest sections of the market, largely because in many cases earnings on the capital of textile concerns are below a level which will make them liable to the National Defence Contribution. The general assumption is that their earnings are improving, but that it may be some while yet before many textile companies re-enter the dividend list.

Oil shares failed to derive benefit from the further increase in the price of petrol, the reactionary market conditions being the main influence, and the general disposition is to await the dividends of the leading oil companies which fall to be declared early next month.

Weekly Prices of British Chemical Products

THERE are no price changes to report in the London markets for general heavy chemicals, rubber chemicals, wood distillation products, pharmaceutical and photographic chemicals, perfumery chemicals and essential oils. In the coal tar products section there have been slight increases in the prices of cresylic acid, solvent naphtha and xylol. Dichloraniline is cheaper, but the price of β-Naphthol is a little higher. Unless otherwise stated the prices below cover fair quantities net and naked at sellers' works.

MANCHESTER.—Buying interest on the Manchester chemical market during the past week has been on a moderate scale and new transactions have included a fair amount of forward buying, the balance covering odd parcels of miscellaneous products for near delivery positions. Textile chemicals are moving steadily into consumption against contracts, with both the Lancashire cotton and Yorkshire woollen industries calling for reasonably good quantities. Prices, as a whole, are on a steady basis, with rather less in the way of fluctuation in the copper and lead compounds than has been the experience during recent weeks. The feature of the by-products market has been a sharp advance in carbolic acid crystals, with a steady home and export demand reported. The rise in petrol prices has had a bullish influence on the light distillates, though so far values of these have not actually been affected.

GLASGOW.—Business in chemicals has been much quieter during the week, both for home trade and export. Prices, however, continue quite firm at about previous figures. Lead and copper products remain unchanged after fluctuating in sympathy with the metals. A fair volume of business has been put through under steady trading conditions in most sections of the coal tar products group. On the manufacturing side the opening tar season offers prospects of greater activity than for some time past. Some forward buying of carbolic and cresylic acid is reported at the maximum prices quoted for last week. Certain fractions of virgin oil are difficult to procure and prices vary with the tar acid content within very wide limits. There have been further export movements of pitch from the Clyde, and prices have firmed to within 32s. to 37s. per ton f.o.b. in bulk.

General Chemicals

ACETONE.—£45 to £47 per ton.

ACID, ACETIC.—Tech., 80%, £30 5s. to £32 5s. per ton; pure 80%, £30 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. MANCHESTER: 80%, commercial, £30 5s.; tech. glacial, £42 to £46.

ACID, BORIC.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

ACID, CHROMIC.—9¼d. per lb., less 2½%; d/d U.K.

ACID, CITRIC.—1s. per lb. MANCHESTER: 1s. SCOTLAND: B.P. crystals, 1s. per lb., less 5%, ex store.

ACID, FORMIC.—85%, in carboys, ton lots, £42 to £47 per ton.

ACID, HYDROCHLORIC.—Spot, 5s. to 7s. 6d. carboy d/d according to purity, strength and locality.

ACID, LACTIC.—LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50: pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50% by vol., £41. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £18 to £25 per ton makers' works.

ACID, OXALIC.—£48 15s. to £57 10s. per ton, according to packages and position. GLASGOW: £2 9s. per cwt. in casks. MANCHESTER: £49 to £55 per ton ex store.

ACID, SULPHURIC.—168° Tw., £4 5s. to £4 15s. per ton; 140° Tw., arsenic-free, £2 15s. to £3 5s.; 140° Tw., arsenious, £2 10s.

ACID, TARTARIC.—1s. 1¼d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 1d. to 1. 1½d. per lb.

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; GLASGOW: Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

ALUMINIUM SULPHATE.—£7 per ton d/d Lancs.; GLASGOW: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—LONDON: Fine white crystals, £16 10s. (See also Salammoniac.)

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

ANTIMONY OXIDE.—£55 10s. per ton.

ARSENIC.—LONDON: £13 10s. per ton c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r. mines. SCOTLAND: White powdered. £17 ex store. MANCHESTER: White powdered Cornish, £17, ex store.

BARIUM CHLORIDE.—£10 per ton. GLASGOW: £11 5s. per ton.

BISULPHITE OF LIME.—£6 10s. per ton f.o.r. London.

BLEACHING POWDER.—Spot, 35/37%. £8 15s. per ton in casks, special terms for contracts. SCOTLAND: £9 per ton net ex store.

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Granulated, £16, crystal, £17; powdered, £17 10s. per ton in 1-cwt. bags, carriage paid.

CALCIUM CHLORIDE.—Solid 70/75% spot, £5 5s. per ton d/d station in drums. GLASGOW: 70/75% solid, £5 10s. per ton net ex store.

CHROMETAN.—Crystals, 2¼d. per lb.; liquor, £19 10s. per ton d/d

CREAM OF TARTAR.—£3 19s. per cwt. less 2½%. GLASGOW: 99%, £4 7s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£22 10s. per ton.

GLYCERINE.—Chemically pure, double distilled, 1.260 s.g., in tins, £5 7s. 6d. to £6 7s. 6d. per cwt. according to quantity; in drums, £5 to £5 13s. 6d.

IODINE.—Resublimed B.P., 5s. 1d. per lb.

LEAD ACETATE.—LONDON: White, £35 10s. per ton; brown, £35. GLASGOW: White crystals, £34 to £35; brown, £1 per ton less. MANCHESTER: White, £36; brown, £35 10s.

LEAD NITRATE.—£39 per ton.

LEAD, RED.—SCOTLAND: £39 10s. per ton, less 2½%, carriage paid for 2-ton lots.

LEAD (WHITE SUGAR OF).—GLASGOW: £38 10s. per ton net, ex store.

LITHARGE.—SCOTLAND: Ground, £39 10s. per ton, less 2½%, carriage paid for 2-ton lots.

MAGNESITE.—SCOTLAND: Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—SCOTLAND: £7 10s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 per ton, ex wharf.

MERCURY.—Ammoniated B.P. (white precip.), lump, 5s. 11d. per lb.; powder B.P., 6s. 1d.; bichloride B.P. (corros. sub.) 5s. 2d.; powder B.P. 4s. 10d.; chloride B.P. (calomel), 5s. 11d.; red oxide cryst. (red precip.), 7s.; levig. 6s. 6d.; yellow oxide B.P. 6s. 4d.; persulphate white B.P.C., 6s. 1d.; sulphide black (hyd. sulph. cum sulph. 50%), 6s. For quantities under 112 lb., 1d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

PARAFFIN WAX.—SCOTLAND: 3½d. per lb.

PHENOL.—6¼d. to 7¼d. per lb.

POTASH, CAUSTIC.—LONDON: £42 per ton. MANCHESTER: £39.

POTASSIUM BICHROMATE.—SCOTLAND: 5d. per lb., less 5%, carriage paid.

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. GLASGOW: 4¼d. per lb. MANCHESTER: £37 10s. per ton.

POTASSIUM IODIDE.—B.P. 4s. 3d. per lb.

POTASSIUM NITRATE.—£27 per ton. GLASGOW: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 9¾d. per lb. SCOTLAND: B.P. Crystals, 9¾d. MANCHESTER: B.P. 11d. to 1s.

POTASSIUM PRUSSATE.—6¼d. per lb. SCOTLAND: 7d. net, in casks, ex store. MANCHESTER: Yellow, 6¼d. to 6¾d.

SALAMMONIAC.—First lump spot, £41 17s. 6d. per ton d/d in barrels. GLASGOW: Large crystals, in casks, £38.

SALT CAKE.—Unground, spot, £3 16s. 6d. per ton.

SODA ASH.—58% spot, £5 12s. 6d. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid, 76/77° spot, £12 10s. per ton d/d station. SCOTLAND: Powdered 98/99%, £17 10s. in drums, £18 5s. in casks, Solid 76/77°, £14 12s. 6d. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£18 per ton carriage paid North. GLASGOW: £18 10s. per ton net ex store.

SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. GLASGOW: £12 15s. per ton in 1 cwt. kegs, £11 per ton in 2-cwt. bags. MANCHESTER: £10 10s.

SODIUM BICHROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount 5%. MANCHESTER: 4d. per lb. GLASGOW: 4d., less 5% carriage paid.

SODIUM BISULPHITE POWDER.—60/62%, £20 per ton d/d 1 cwt. iron drums for home trade.

SODIUM CARBONATE, MONOHYDRATE.—£15 per ton d/d in minimum ton lots in 2 cwt. free bags.

SODIUM CHLORATE.—£26 10s. to £30 per ton. GLASGOW: £1 10s. per cwt.

Sodium Chromate.—4d. per lb. d/d U.K.
Sodium Hyposulphate.—Commercial, 2 ton lots d/d, £10 5s. per ton; photographic, £14 5s. Manchester: Commercial, £10; photographic, £14 10s.
Sodium Metasilicate.—£14 per ton, d/d U.K. in cwt. bags.
Sodium Nitrate.—Refined, £7 15s. per ton for 6-ton lots d/d.
Sodium Nitrite.—£18 5s. per ton for ton lots.
Sodium Perborate.—10%, 9½d. per lb. d/d in 1-cwt. drums.
Sodium Phosphate.—£13 per ton.
Sodium Prussiate.—4d. per lb. for ton lots. Glasgow: 5d. to 5¾d. ex store. Manchester: 4¼d. to 4½d.
Sodium Silicate.—£9 10s. per ton.
Sodium Sulphate (Glauber Salts).—£3 per ton d/d.
Sodium Sulphate (Salt Cake).—Unground spot, £3 12s. 6d. per ton d/d station in bulk. Scotland: Ground quality, £3 5s. per ton d/d. Manchester: £3 10s.
Sodium Sulphide.—Solid 60/62%, Spot, £11 5s. per ton d/d in drums; crystals 30/32%, £8 15s. per ton d/d in casks. Manchester: Concentrated solid, 60/62%, £11; commercial, £8.
Sodium Sulphite.—Pea crystals, spot, £13 5s. per ton d/d station in kegs. Commercial spot, £8 15s. d/d station in bags.
Sulphate of Copper.—£20 per ton, less 2%, in casks. Manchester: £23 per ton f.o.b. Scotland: £25 per ton less 5%, Liverpool, in casks.
Sulphur Precip.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.
Zinc Sulphate.—Crystals, £9 per ton, f.o.r., in bags.

Rubber Chemicals

Antimony Sulphide.—Golden, 6½d. to 1s. 1d. per lb., according to quality. Crimson, 1s. 5½d. to 1s. 7d. per lb., according to quality.
Arsenic Sulphide.—Yellow, 1s. 5d. to 1s. 7d. per lb.
Barytes.—£6 to £7 10s. per ton, according to quality.
Cadmium Sulphide.—7s. to 7s. 3d. per lb.
Carbon Bisulphide.—£31 to £33 per ton, according to quantity, drums extra.
Carbon Black.—3 11/16d. to 4 13/16d. per lb., ex wharf.
Carbon Tetrachloride.—£41 to £46 per ton, according to quantity, drums extra.
Chromium Oxide.—Green, 1s. 2d. per lb.
Diphenylguanidine.—2s. 2d. per lb.
India-rubber Substitutes.—White, 4½d. to 5d. per lb.; dark, 3¾d. to 4¼d. per lb.
Lamp Black.—£22 to £23 per ton d/d London; vegetable black, £28 to £48.
Lead Hyposulphite.—9d. per lb.
Lithopone.—30%, £16 10s. to £17 5s. per ton.
Sulphur.—£9 to £9 5s. per ton. Sulphur precip. B.P., £55 to £60 per ton. Sulphur precip. comm., £50 to £55 per ton.
Sulphur Chloride.—5d. to 7d. per lb., according to quantity.
Vermilion.—Pale, or deep, 5s. 3d. per lb., 1-cwt. lots.
Zinc Sulphide.—10d. to 11d. per lb., according to quality.

Nitrogen Fertilisers

Sulphate of Ammonia.—Neutral quality, basis 20.6 per cent. nitrogen, delivered in 6-ton lots to farmer's nearest station, £7 5s. per ton.
Calcium Cyanamide.—£7 5s. per ton, carriage paid to any railway station in Great Britain in lots of four tons and over.
Nitro-Chalk.—£7 5s. per ton for delivery to end of June.
Nitrate of Soda.—£7 12s. 6d. per ton for delivery up to end of June.
Concentrated Complete Fertilisers.—£10 12s. to £11 1s. per ton delivered in 6-ton lots to farmer's nearest station.
Ammonium Phosphate Fertilisers.—£10 5s. to £13 15s. per ton for delivery up to end of June, delivered in 6-ton lots to farmer's nearest station.

Coal Tar Products

Acid, Cresylic.—97/99%, 4s. 7d. to 4s. 8d. per gal.; 99/100%, 4s. 11d. to 5s. 3d., according to specification; pale 99%, 4s. 9d. to 4s. 10d.; dark, 3s. 10d. to 4s. Glasgow: Pale, 99/100%, 4s. 6d. to 5s. per gal.; pale 97/99%, 4s. 6d. to 4s. 10d., dark, 97/99%, 4s. to 4s. 3d.; high boiling acids, 2s. 4d. to 2s. 8d. American specification, 4s. to 4s. 3d. Manchester: Pale, 99/100%, 5s.
Acid, Carbolic.—Crystals, 6¾d. to 7¼d. per lb.; crude, 60's, 3s. 5d. to 3s. 8d. per gal. Manchester: Crystals, 8¼d. per lb. f.o.b. in drums; crude 3s. 8d. per gal. Glasgow: Crude, 60's, 3s. 2d. to 3s. 8d. per gal.; distilled, 60's, 4s. to 4s. 3d.
Benzol.—At works, crude, 9½d. to 10d. per gal.; standard motor 1s. 3d. to 1s. 3½d.; 90%, 1s. 4d. to 1s. 4½d.; pure, 1s. 8d. to 1s. 8½d. London: Motor, 1s. 3½d. Glasgow: Crude, 9½d. to 10½d. per gal.; motor, 1s. 4d. to 1s. 5d.
Creosote.—B.S.I. Specification standard, 5¾d. to 6d. per gal. f.o.r. Home, 3¾d. d/d. London: 4½d. f.o.r. North: 5d. London. Manchester: 5½d. to 6¼d. Glasgow: B.S.I. Specification 5½d. to 6d. per gal.; washed oil, 5d. to 5½d.; lower sp. gr. oils, 5d. to 5½d.
Naphtha.—Solvent, 90/160%, 1s. 7d. to 1s. 8d. per gal.; 95/160%, 1s. 8d. to 1s. 9d.; 90/190%, 1s. 2d. to 1s. 3d. London: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. Glasgow: Crude, 6d. to 6¾d. per gal.; 90% 160, 1s. 6d. to 1s. 7d. 90% 190, 1s. 1d. to 1s. 2d.
Naphthalene.—Crude, whizzed or hot pressed, £12 to £13 per ton; purified crystals, £18 to £20 per ton in 2-cwt. bags. London: Fire lighter quality, £5 to £5 10s. per ton; crystals, £27 to £27 10s. Glasgow: Fire lighter, crude, £6 to £7 per ton (bags free). Manchester: Refined £22 per ton f.o.b.
Pyridine.—90/140%, 9s. to 10s. per gal.; 90/180, 2s. 9d. to 3s. 6d. Glasgow: 90% 140, 9s. to 10s. per gal.; 90% 160, 7s. to 8s.; 90% 180, 2s. 6d.
Toluole.—90%, 2s. per gal.; pure, 2s. 5d. Glasgow: 90%, 120, 1s. 10d. to 1s. 11d. per gal.
Pitch.—Medium, soft, 36s. to 37s. per ton, in bulk at makers' works. Manchester: 35s. f.o.b., East Coast. Glasgow: f.o.b. Glasgow, 32s. to 37s. per ton; in bulk for home trade, 32s. 6d.
Xylol.—Commercial, 2s. 2d. to 2s. 3d. per gal.; pure, 2s. 4d. to 2s. 5d. Glasgow: Commercial, 1s. 11d. to 2s. per gal.

Wood Distillation Products

Acetate of Lime.—Brown, £8 10s. to £9 per ton; grey, £10 10s. to £11 10s. Liquor, brown, 30° Tw., 6d. to 8d. per gal. Manchester: Brown, £9 10s.; grey, £11 10s.
Charcoal.—£5 15s. to £11 per ton, according to grade and locality.
Methyl Acetone.—40-50%, £42 to £45 per ton.
Wood Creosote.—Unrefined 6d. to 1s. 6d. per gal., according to boiling range.
Wood, Naphtha, Miscible.—2s. 9d. to 3s. 3d. per gal.; solvent, 3s. 6d. to 3s. 9d. per gal.
Wood Tar.—£2 10s. to £4 per ton.

Intermediates and Dyes

Acid, Benzoic, 1914 B.P. (ex toluol).—1s. 9½d. per lb. d/d buyer's works.
Acid, Gamma.—Spot, 4s. per lb. 100% d/d buyer's works.
Acid, H.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.
Acid Naphthionic.—1s. 8d. per lb.
Acid, Neville and Winther.—Spot, 3s. per lb. 100%.
Acid, Sulphanilic.—Spot, 8d. per lb. 100%, d/d buyer's works.
Aniline Oil.—Spot, 8d. per lb., drums extra, d/d buyer's works
Aniline Salts.—Spot, 8d. per lb. d/d buyer's works, casks free.
Benzidine, HCl.—2s. 5d. per lb., 100% as base, in casks.
m-Cresol 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.
o-Cresol 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.
p-Cresol 34-5° C.—1s. 7d. to 1s. 8d. per lb. in ton lots.
Dichloraniline.—1s. 11½d. to 2s. 3d. per lb.
Dimethylaniline.—Spot, 1s. 6d. per lb., package extra.
Dinitrobenzene.—7½d. per lb.
Dinitrochlorbenzene, Solid.—£72 per ton.
Dinitrotoluene.—48/50° C., 8½d. per lb.; 66/68° C., 10d.
Diphenylamine.—Spot, 2s. per lb., d/d buyer's works.
α-Naphthol.—Spot, 2s. 4d. per lb., d/d buyer's works.
β-Naphthol.—9½d. to 9⅝d. per lb.; flake, 9½d. to 9⅝d.
α-Naphthylamine.—Lumps, 1s. per lb.; ground, 1s. 0½d. in casks.
β-Naphthylamine.—Spot, 2s. 9d. per lb., d/d buyer's works in casks.
o-Nitraniline.—3s. 11d. per lb.
m-Nitraniline.—Spot, 2s. 7d. per lb., d/d buyer's works.
p-Nitraniline.—Spot, 1s. 8d. to 2s. 1d. per lb. d/d buyer's works.
Nitrobenzene.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra. 1-ton lots d/d buyer's works.
Nitronaphthalene.—9d. per lb.; P.G., 1s. 0½d. per lb.
Sodium Naphthionate.—Spot, 1s. 9d. per lb., 100% d/d buyer's works.
o-Toluidine.—10½d. per lb., in 8/10-cwt. drums, drums extra.
p-Toluidine.—1s. 10½d. per lb., in casks.
m-Xylidine Acetate.—4s. 3d. per lb., 100%.

Latest Oil Prices

London, April 28.—Linseed Oil was steady. Spot, £31 5s. (small quantities); May, £28 15s.; June-Aug., and Sept.-Dec., £28 17s. 6d., naked. Soya Bean Oil was steady. Oriental (bulk), afloat, Rotterdam, £27 5s. Rape Oil was inactive. Crude, extracted, £36; technical refined, £37, naked, ex wharf. Cotton Oil was quiet. Egyptian crude, £30 10s.; refined common edible, £34 5s.; deodorised, £36 5s., naked, ex mill (small lots £1 10s. extra). Turpentine was quiet. American, spot, 38s. 9d. per cwt.
Hull.—Linseed Oil.—Spot, quoted £29 7s. 6d. per ton; April, £28 15s.; May-Aug., £28 17s. 6d.; Sept.-Dec., £29. Cotton Oil.—Egyptian, crude, spot, £30 10s. per ton; edible, refined, spot, £33 10s.; technical, spot, £33 10s.; deodorised, £35 10s., naked. Palm Kernel Oil.—Crude, f.m.q., spot, £28 10s. per ton, naked. Groundnut Oil.—Extracted, spot, £32 10s. per ton; deodorised, £35 10s. Rape Oil.—Extracted, spot, £35 per ton; refined, £36. Soya Oil.—Extracted, spot, £33 10s. per ton; deodorised, £36 10s. Cod Oil.—F.o.r. or f.a.s., 27s. 6d. per cwt. in barrels. Castor Oil.—Pharmaceutical, 46s. per cwt. first, 41s.; second, 39s. Turpentine.—American, spot, 40s. 6d. per cwt.

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